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AMERICAN JOURNAL OF OPHTHALMOLOGY

VOLUME 28 SEPTEMBER, 1945 NUMBER 9

CONCERNING THE SIMILARITY OF THE DEVELOPING RETINA AND BRAIN WALL IN HUMAN EMBRYOS*

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We see as we think, unconsciously. The moment that we become conscious that we are seeing or thinking, something is wrong. Descartes's celebrated proposition, "Cogito ergo sum," I think, therefore I am, may well be paraphrased by saying, "Cogito ergo video," I think, therefore I see.

The function of vision differs from that of all other organs of special sense, the reason for which is that the retina is a modified part of the brain and that the optic nerve is a brain tract connecting it with another part of the brain. Furthermore, the retina is not derived directly from the surface ectoderm as are the other organs of special sense but has its origin in the primordium of the central nervous system.[1,2] The cells from which the retina is to form are in the ectoderm, which folds in to form the neural tube. After the anterior end of the neural tube has expanded into the anterior cerebral vesicle, the portion of the wall containing these cells grows out, or evaginates, and the optic vesicles are formed (fig. 1). Shortly after the optic evaginations occur a dorso-lateral swelling appears in the telencephalon, the anterior division of the anterior cerebral vesicle (fig. 2). This swelling is the pallium, or mantle, from which the lobes of the brain develop.[3] It is with the wall of the anterior part of the pallium that the comparisons with the developing retina are to be made, for the part of the cerebral-vesicle wall from which the optic vesicles evaginated becomes part of the floor of the brain (fig. 2).

At the 4 mm. age (fig. 2) the walls of the cerebral vesicle and of the optic vesicles are composed of a dense mass of undifferentiated epithelial cells. After the optic vesicles invaginate they show a marked change (fig. 3). In the inner wall of the optic cup the cells become arranged in a nuclear layer, or zone, on its outer side—that is, toward the lumen of the optic vesicle—and its inner portion becomes acellular. The outer zone, the one adjacent to the original lumen of the optic vesicle, is the nuclear zone, and the acellular, or inner layer, the one adjacent to the vitreous chamber, is the marginal zone. In the brain wall (fig. 3) the inner portion, that adjacent to the ventricle, is densely nucleated and is called the ependymal zone, or matrix. The outer portion of the wall is acellular and is called the marginal zone.

The wall of the brain is continuous with the wall of the optic cup, and its cavity is in continuity with the residual lumen of the optic vesicle through the lumen of the optic stalk. When the optic vesicle invaginates the invagination is carried along the ventral wall of the stalk (fig. 4), so that the marginal zone of the

* Presented before the St. Louis Ophthalmic Society, January 26, 1945.

optic cup is directly continuous with that of the brain wall through the medium of the fetal fissure. The cells in the nuclear zone of the optic cup and in the ependymal zone of the brain wall proliferate and migrate into the marginal layer or zone.[2] In this fashion the different layers or zones of both retina and brain wall are formed.[2] During the first few weeks of embryonal life the process is practically the same in the brain wall and retina, and, although the layers have been given different names, in the beginning at least, the nuclear zone of the optic cup as well as the inner zone of the brain wall should be called the ependymal, for in each it manufactures the cells which make the definitive retina and brain wall.

At the 8 mm. age (fig. 5) the two layers are present in both brain wall and inner wall of optic cup. The cellular or ependymal, zone is much broader than the acellular, or marginal, zone in each. The section of the 8-mm. embryo is not only of interest because it shows the two zones but it is cut so that it passes almost vertically through the fetal fissure, and the inner wall of the optic cup can be seen to be continuous with the floor of the brain into which the nerve fibers will pass after they have developed in the inner wall of the optic cup and have grown back through the wall of the optic stalk.

The 10 mm. age is much more developed (fig. 6). The optic stalks are longer; their walls are continuous with the brain wall; and their lumen with the cavity of the brain. The marginal zone (fig. 7) of the inner wall of the optic cup passes through the fetal fissure along the ventral wall of the optic stalk and is continuous with the marginal zone of the brain wall. At this age the marginal and ependymal zones are nearly equal to each other in width in both optic cup (fig. 7) and brain wall (fig. 8). Fibers cross the marginal zone at right angles to it in each and reach the surface. These fibers develop foot plates which join and form a membrane, the external limiting membrane of the brain wall (fig. 8) and the internal limiting membrane of the retina (fig. 7). Some cells have proliferated in the ependymal zones and have migrated into the marginal zones of brain wall and inner wall of optic cup. In this study it must be borne in mind that the external surface of the brain wall is continuous with the inner surface of the optic cup so that which is external in the one is internal in the other.

The embryo of the 24 mm. age shows much more development in both the brain wall and retina (fig. 9). A section through the upper portion of the head passes through the neopallial walls and the anterior horns of the lateral ventricles. The pallial walls are continuous with the corpus striatum, and the lateral ventricles communicate freely with the third ventricle. The brain wall at this age has three zones, an inner, middle, and outer, the ependymal, mantle, and marginal zones.[2] A section through the anterior pallial wall of the 24 mm. embryo seen under higher magnification (fig. 10) shows a dense layer of cells with oval nuclei adjacent to the ventricle, the ependymal zone. Its cells have proliferated and some have wandered out into the marginal zone and formed the mantle zone. In the mantle zone the cells are more loosely arranged and many have round nuclei. The mantle zone fades into the acellular marginal zone, and there is no sharp line of demarcation between the ependymal and mantle zones. The ependymal zone corresponds to the nuclear zone of the retina, for in both retina and brain wall its cells proliferate and migrate into the marginal zone. Many of these cells may be seen in the marginal zone of each. Fibers cross the marginal zone at right angles to it,

and where they reach the surface they form a membrane, the external limiting membrane, as Mueller's fibers form the internal limiting membrane of the retina.

In transverse sections of the eye of the same 24 mm. embryo (fig. 11) the inner wall of the optic cup presents an appearance similar to that of the pallial wall. There is a dense layer of cells with oval nuclei adjacent to the residual lumen of the optic vesicle, the nuclear zone, which corresponds to the ependymal zone of the pallial wall. In this layer the cells proliferate and then wander out or migrate into the marginal zone and form the other layers of the retina. In the equatorial and anterior regions it is seen to shade into the marginal layer as the ependymal zone did in the pallial wall to form the mantle zone. In the retina this portion is also loosely arranged and contains cells with rounded nuclei. These cells are the ganglion cells, and in the region near the optic nerve, the relatively older portion of the eye, they form a separate layer, the ganglion cell layer. The axons of these cells grow into the lighter-colored area, the marginal zone, and form the nerve fiber layer. The nerve fiber layer corresponds to the outer part of the marginal zone in the brain wall. Fibers cross the nerve fiber layer (fig. 12) at right angles to it, and when they reach its inner surface they end in foot plates which join and form the membrana limitans interna, which corresponds to the external limiting membrane of the pallial wall.

In embryos of the 40 mm. age (fig. 13) the brain wall has developed very much. In sections through the upper part of the head the neopallial walls present a zone of densely packed cells with oval nuclei adjacent to the lateral ventricles, the ependymal zone. The ependymal zone shades out into a layer of loosely arranged cells, the inner portion of the mantle zone. Beyond this is a light-colored layer, the outer portion of the mantle zone, composed of fibers from the corpus striatum and the optic thalamus. This layer will be the great white matter of the definitive brain. To the outer side of this is a dark layer of cells. These are cells that have proliferated in the ependymal zone and have migrated into the marginal zone and stopped at the striatum cribrosum of the marginal zone. They are the pyramidal cells. This layer will be the definitive gray matter of the cortex of the brain. To the outer side of this layer is a thin fiber layer, the marginal veil of His. These two divisions of the marginal zone will be the cortex of the definitive brain. Bands of nerve fibers from the corpus striatum can be seen passing into the nerve fiber portion of the mantle zone.

A section of the neopallial wall of the same embryo (fig. 14) seen under higher magnification shows the details of each zone. The ependymal zone with its cells with oval nuclei corresponds to the nuclear zone of the retina. In this zone adjacent to the ventricles are some nuclei which stain intensely and have the appearance of the primitive cones in the retina of the same embryo. Occasional cilia are seen projecting into the ventricle. The inner or nuclear portion of the mantle zone, the loosely arranged cells shading off from the denser ependymal zone, contains many cells with round nuclei and some oval cells with processes which are fibers extending to the surface to form the outer limiting membrane as Mueller's fibers do to form the internal limiting membrane in the retina. The nuclear portion of the mantle zone corresponds to what will be the inner nuclear layer of the retina. The nerve fiber portion of the mantle zone corresponds to the inner plexiform layer of the retina. Numerous cells with round and oval nuclei are seen in it. The nuclear portion of the marginal

zone, the pyramidal cell layer, corresponds to the ganglion cell layer of the retina, and the outer fiber portion, the marginal veil of His, to the nerve fiber layer of the retina; the outer limiting membrane of the pallial wall to the internal limiting membrane of the retina. In a section through a portion of the retina (fig. 15) of the same embryo there is a dense outer layer of cells with oval nuclei adjacent to the original lumen of the optic vesicle, the nuclear layer. It corresponds to the ependymal zone and nuclear portion of the mantle zone of the pallial wall. To the outer side of this is a row of cells with somewhat oval nuclei, the primitive cones (similar in appearance to the cells adjacent to the ventricle in the ependymal zone of the pallial wall). To the outer side of these cells is the external limiting or basement membrane. Occasional cilia are seen projecting into the residual lumen of the optic vesicle. To the inner side of the nuclear layer is a light-colored layer, the inner plexiform layer, which corresponds to the fiber portion of the mantle zone of the pallial wall. To the inner side of this is the layer of ganglion cells which corresponds to the layer of pyramidal cells. To the inner side of this is the nerve fiber layer which is situated like the marginal veil of His. Mueller's fibers cross the nerve fiber layer and end in the membrana limitans interna, as the fibers which cross the marginal veil of His end in the external limiting membrane of the pallial wall.

The 45 mm. age (fig. 16) shows much more development of the brain wall and retina. A horizontal section through the eye reveals the nerve fibers passing from the nerve fiber layer of the retina into the optic nerve. In a section of the retina of the same embryo (fig. 17), to the temporal side of the nerve, seen under higher magnification, there is a dense zone of cells with oval nuclei adjacent to the residual lumen of the optic vesicle, the nuclear layer which corresponds to the ependymal zone, and the nuclear portion of the mantle zone in the pallial wall. It is covered by the external limiting membrane to the inner side of which are the primitive cones that are connected to cilia outside the external limiting membrane. Similar cilia will be seen in the sections of the pallial wall of the same embryo. The nuclear layer can still be called the ependymal zone, for its cells are still being proliferated and differentiated. Its inner portion, that comparable to the mantle zone of the brain wall, will ultimately be separated by the external plexiform layer from nuclei of the rods and cones and will be the inner nuclear layer containing the bipolar cells, amacrine cells, and horizontal cells as well as nuclei of Mueller's fibers. To the inner side of this layer is a layer that will be the inner plexiform layer, which resembles the outer fiber portion of the mantle zone of the pallium. To the inner side of this is the ganglion cell layer, which corresponds to the pyramidal cell layer in the marginal zone of the pallium. To the inner side of the ganglion cell layer is the nerve fiber layer corresponding to the marginal veil of His. The nerve fiber layer is crossed at right angles by Mueller's fibers, which end in the membrana limitans interna, which occupies a position similar to the external limiting membrane of the brain wall. A higher magnification of a portion of the same retina nearer to its center (fig. 18) shows all the described details more perfectly. The ganglion cells with their dendrites, Mueller's fibers with their nuclei, the cone cells and their cilia.

Figure 19. Higher magnification. In a section of the anterior portion of the neopallial wall of the same embryo the ependymal zone is proportionately narrower than in the younger embryos, for so many of its cells have proliferated

and migrated. What is finally left of the ependymal zone will remain as the lining of the ventricles. In its inner portion there are cells adjacent to the ventricles resembling the primitive cones, and from this layer cilia project into the ventricles. They are not so numerous nor so large as in the retina. The cells in the inner or nuclear portion of the mantle zone are loosely arranged and are beginning to form in layers. This part corresponds to the inner part of the nuclear layer of the retina. The outer, or fibrous, division of the mantle zone is broader than before. In it many cells are seen. Long fibers, some of whose oval nuclei can be seen, cross it at right angles and end in the outer limiting membrane as Mueller's fibers were seen to end in the internal limiting membrane of the retina. The layer of pyramidal cells, which will be the definitive gray matter of the cortex, is broader and more defined and resembles the ganglion cell layer of the retina. The outer fiber portion of the marginal zone, the marginal veil of His, is narrower. This layer will be the definitive molecular, superficial or neuroglia layer of the cortex.[4] It is located in a position similar to the fiber layer of the retina. Outside of this is the external limiting membrane, which corresponds to the membrana limitans interna of the retina. From this age on both the retina and brain wall become more highly specialized and their resemblance in microscopic sections lessens but their functional relation increases with the development of their many coördinating features and the joy of seeing becomes the expression of a developed brain.

1914 Travis Street.

References

[1] Bailey and Miller. Text-book of embryology. Ed. 4. New York, Wm. Wood & Co., 1921, p. 533

[2] Keibel and Mall. Manual of human embryology. Philadelphia, Lippincott & Co., 1912, v. 2, pp. 96, 97, 98, 99, 218.

[3] Jordan and Kindred. Text-book on embryology. Ed. 4, New York, D. Appleton Century Co., Inc., 1942, p. 352.

[4] Gray's Anatomy. American edition. Reëdited by John Chalmers Da Costa, Philadelphia and New York, Lea Bros. & Co., 1905, p. 919.

The illustrations which follow are unretouched photographs of sections in my private collection and are of human embryos with the exception of figure 1.

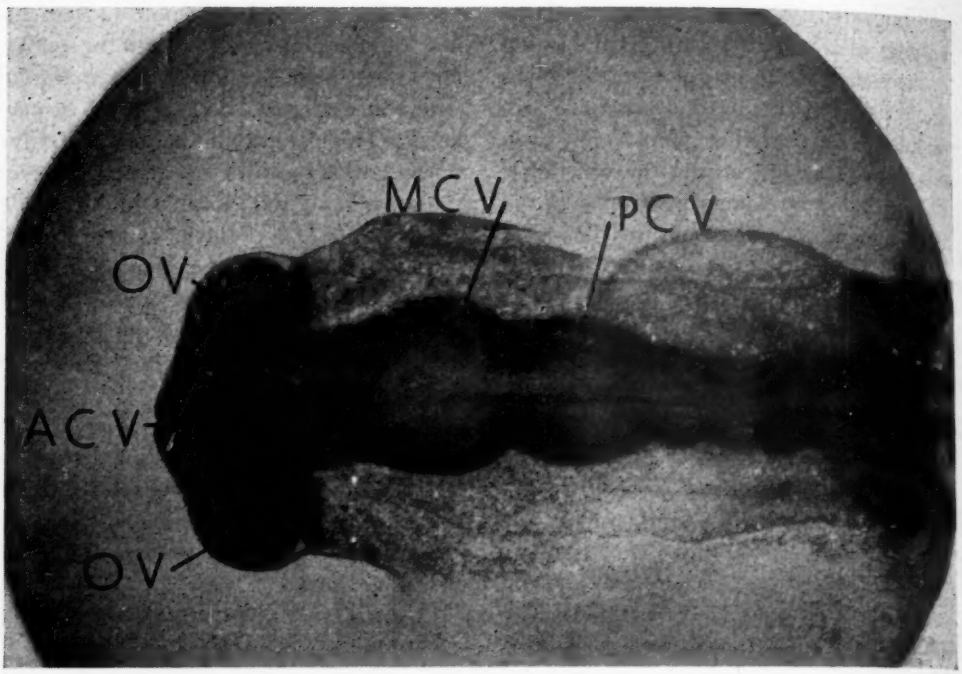

Fig. 1 (Haden). 33 hour chick. A C V, anterior cerebral vesicle (Prosencephalon). M C V, middle cerebral vesicle (Mesencephalon). P C V, posterior cerebral vesicle (Rhombencephalon). O V, optic vesicles.

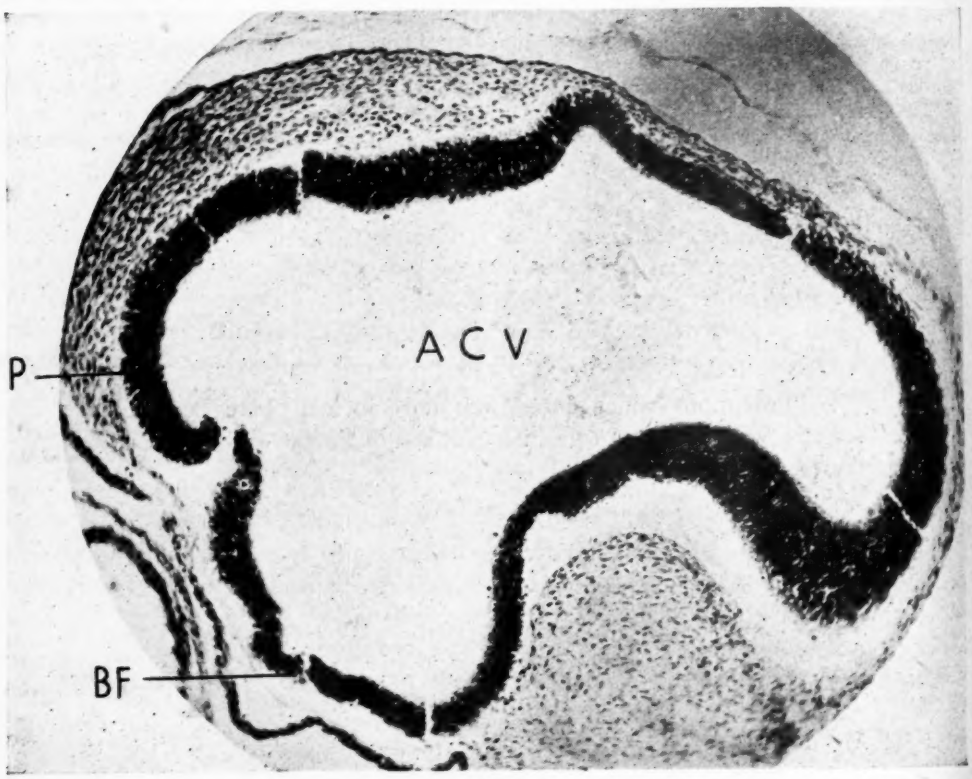

Fig. 2 (Haden). 4 mm. human embryo. Median sagittal section through the A C V, anterior cerebral vesicle. P, pallium, or mantle. B F, position of future brain floor.

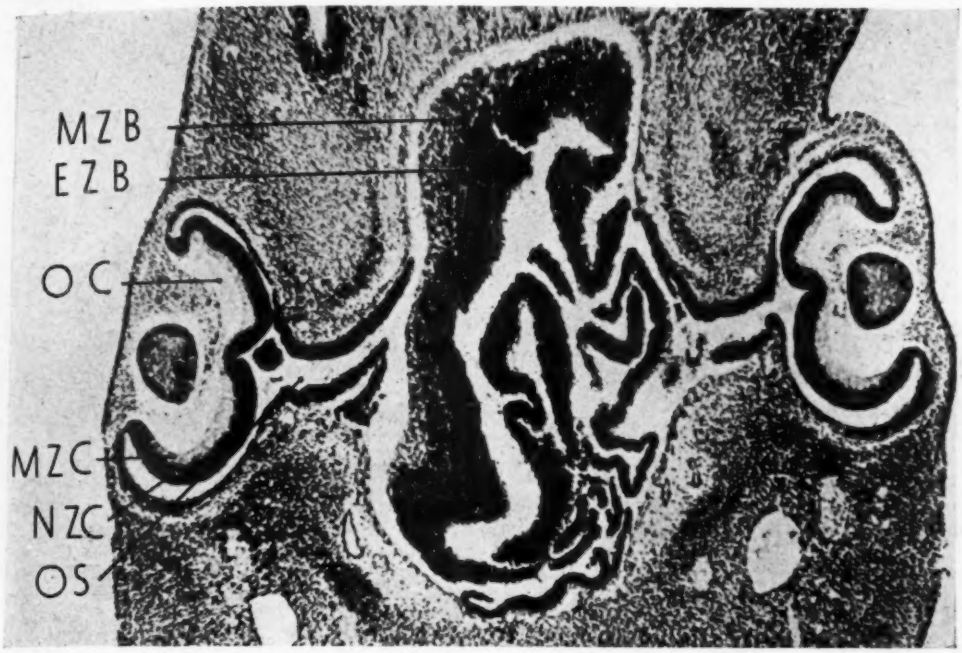

Fig. 3 (Haden). O C, optic cup. O S, optic stalk. N Z C, nuclear zone of inner wall of optic cup. M Z C, marginal zone of inner wall of optic cup. E Z B, ependymal zone of brain wall. M Z B, marginal zone of brain wall.

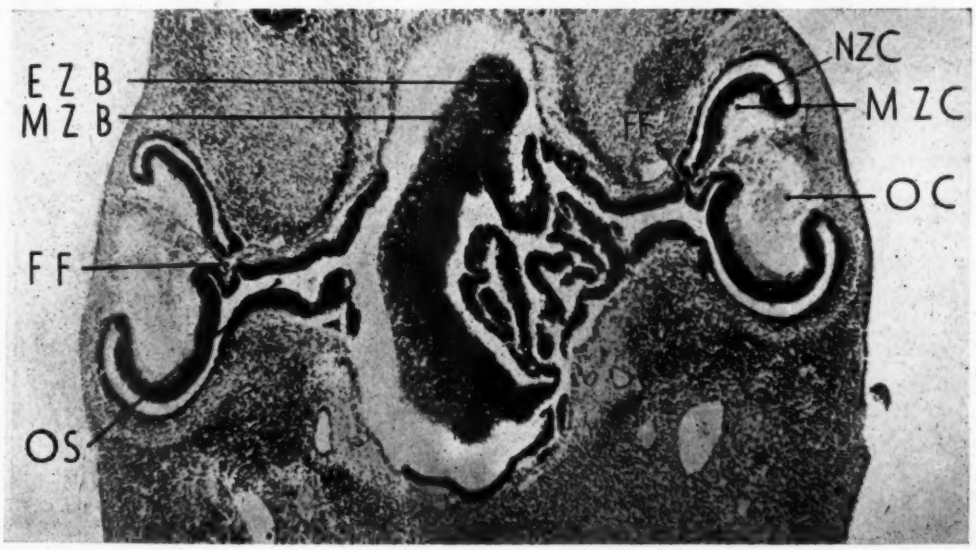

Fig. 4 (Haden). O C, optic cup. O S, optic stalk. F F, foetal fissure. N Z C, nuclear zone of optic cup. M Z C, marginal zone of optic cup. E Z B, ependymal zone of brain wall. M Z B, marginal zone of brain wall.

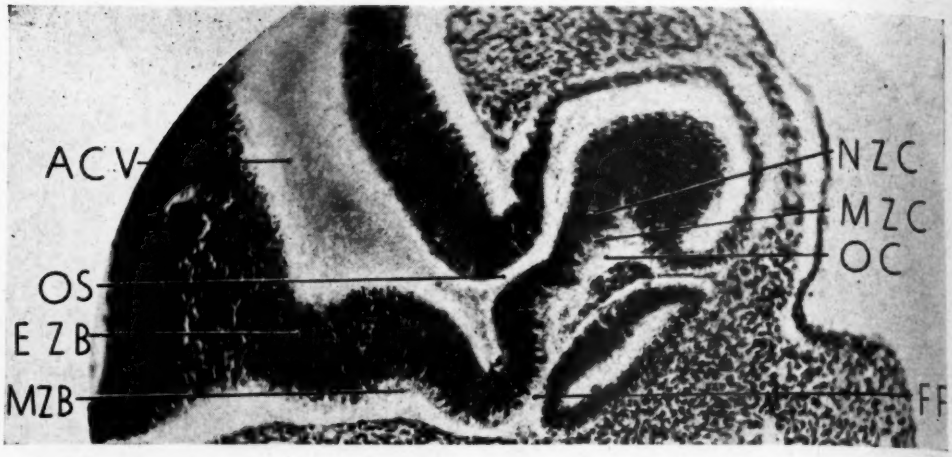

Fig. 5 (Haden). 8 mm. embryo, lower portion of A C V, anterior cerebral vesicle. O C, optic cup. E Z B, ependymal zone of brain wall. M Z B, marginal zone of brain wall. N Z C, nuclear zone of optic cup. M Z C, marginal zone of optic cup. O S, optic stalk. F F, fetal fissure.

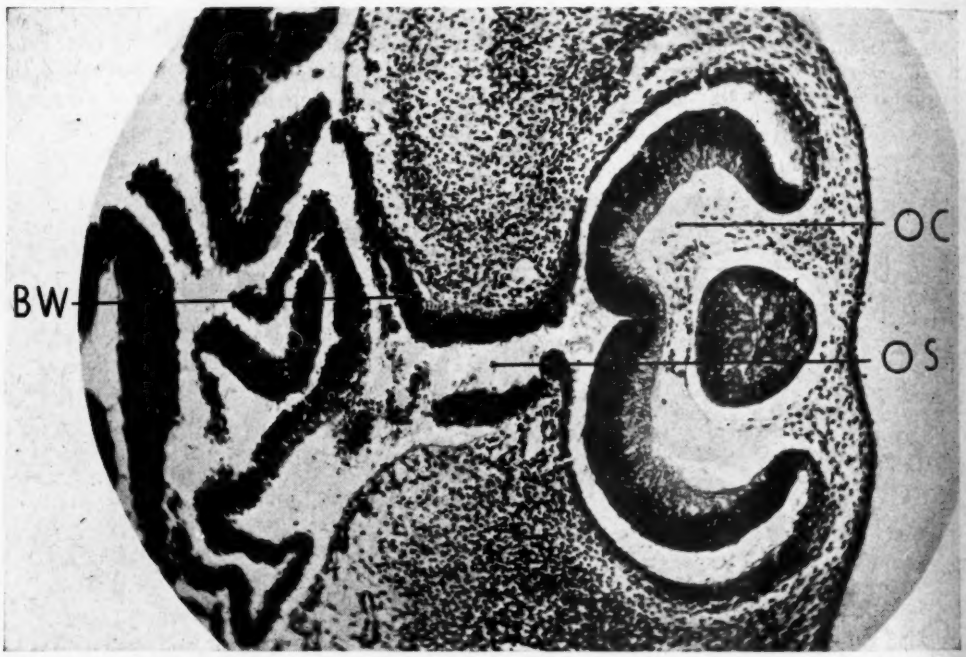

Fig. 6 (Haden). 10 mm. embryo. O C, optic cup. O S, optic stalk. B W brain wall.

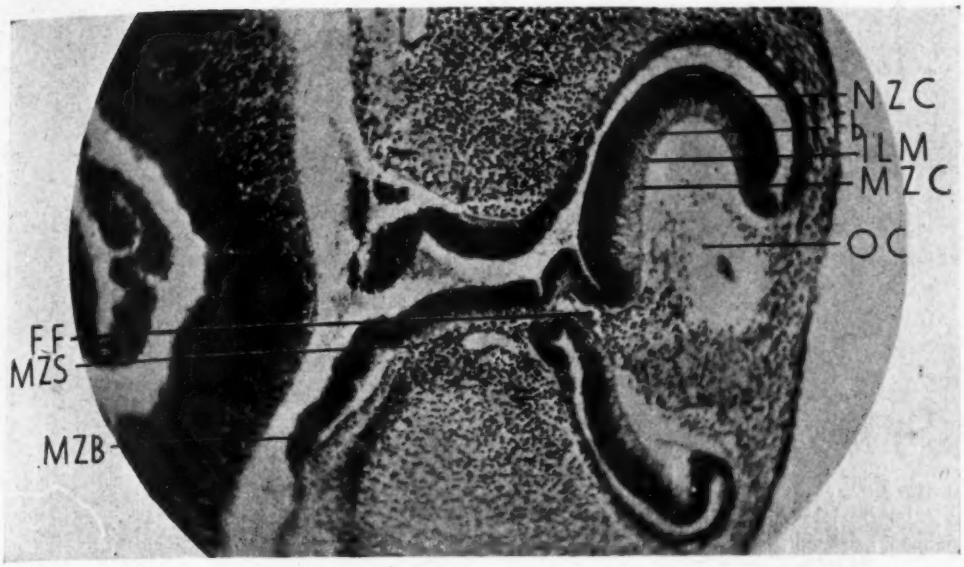

Fig. 7 (Haden). 10 mm. embryo. Section passes through F F, fetal fissure. N Z C, nuclear zone cup. O C, optic cup. M Z C, marginal zone cup. M Z S, marginal zone of stalk. M Z B, marginal zone of brain wall. Fb, Mueller's fibers. I L M, internal limiting membrane.

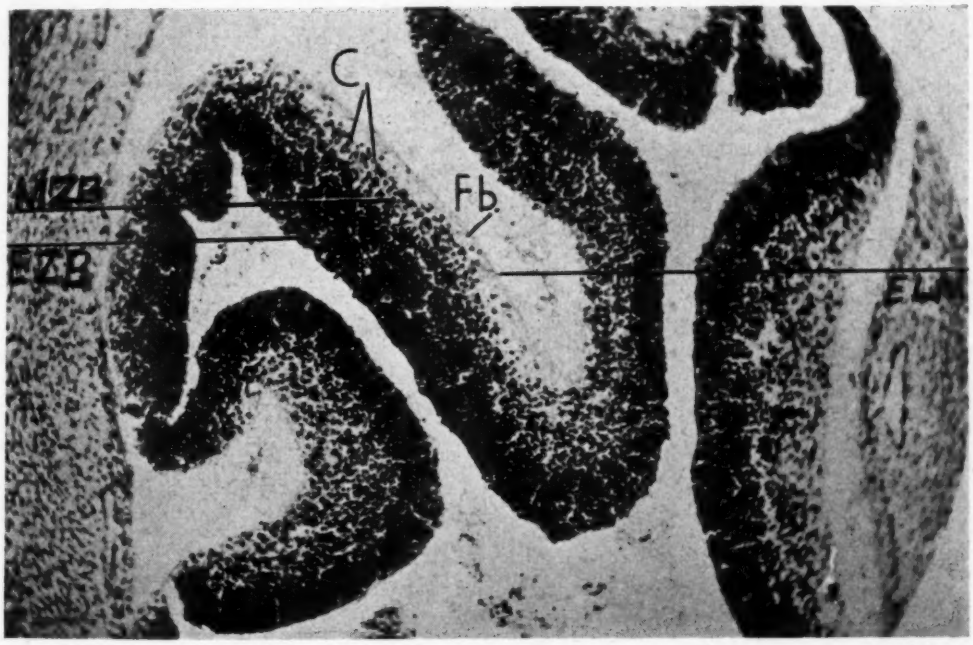

Fig. 8 (Haden). 10 mm. embryo, section of brain wall (anterior cerebral vesicle) higher level than figure 6. E Z B, ependymal zone of brain wall. M Z B, marginal zone of brain wall. C, cells in marginal zone. Fb, fibers crossing marginal zone to end in E L M, external limiting membrane.

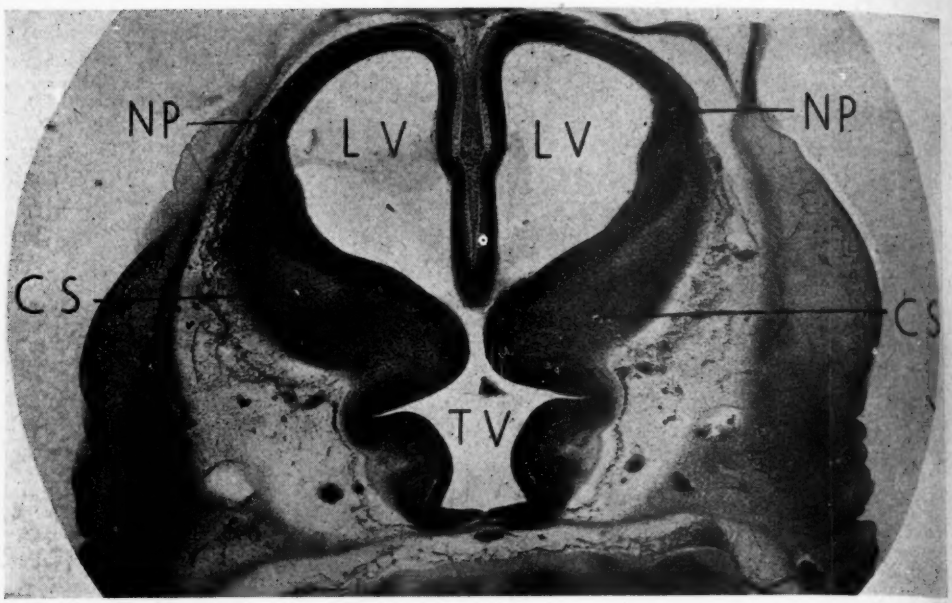

Fig. 9 (Haden). 24 mm. embryo, section passes through upper part of head. N P, neopallium (brain wall). L V, anterior horn of lateral ventricle. T V, third ventricle. C S, corpus striatum.

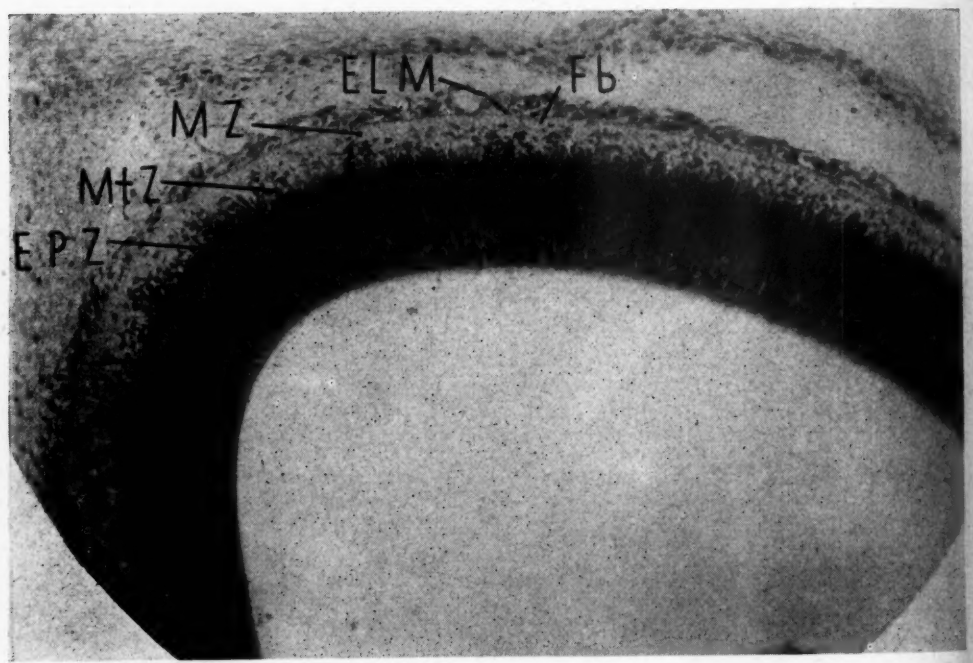

Fig. 10 (Haden). 24 mm. embryo higher magnification of a section of brain wall of figure 9. E P Z, ependymal zone of brain wall. Mt Z, mantle zone of wall. M Z, marginal zone of brain wall. Fb, Fibers crossing marginal zone to end in. E L M, external limiting membrane.

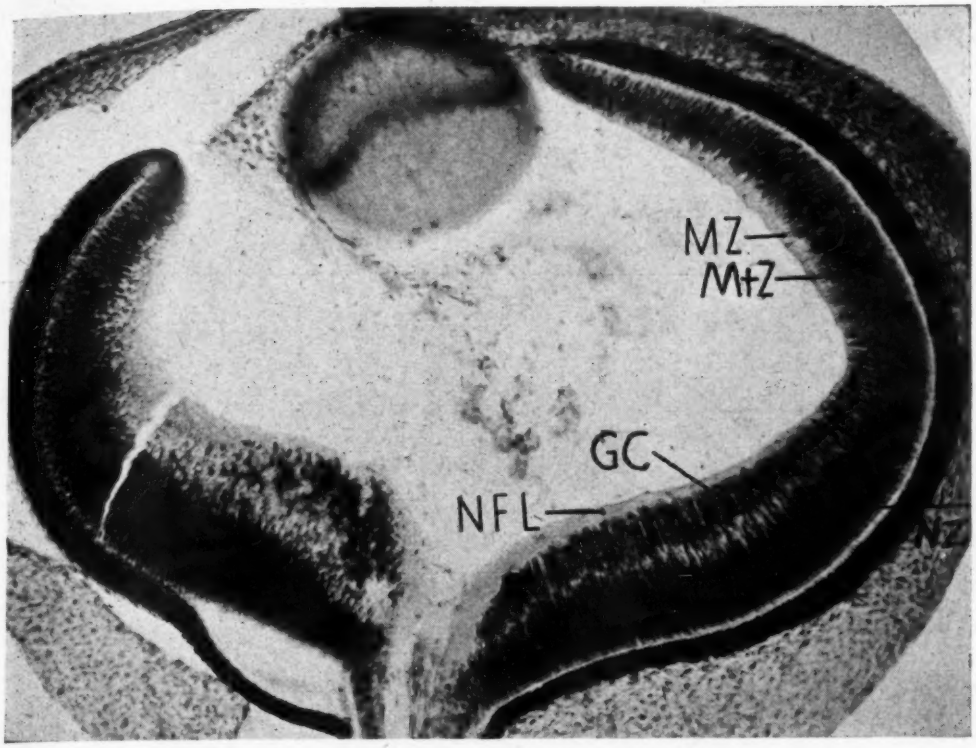

Fig. 11 (Haden). 24 mm. (same embryo as in figs. 9 and 10). Horizontal section through eye. N Z, nuclear zone. Mt Z, mantle zone. M Z, marginal zone. G C, ganglion cell layer. N F L, nerve fiber layer.

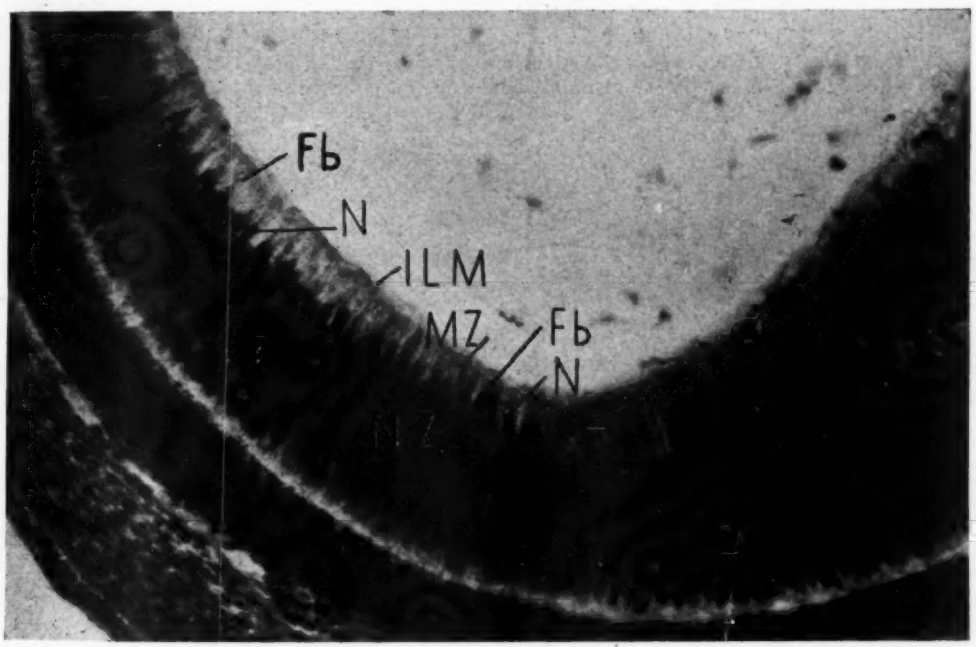

Fig. 12 (Haden). 24 mm. embryo, higher magnification of section of retina in figure 11. Fb, Mueller's fibers. I L M, internal limiting membrane. N, nuclei of Mueller's fibers. M Z, marginal zone. N Z, nuclear zone.

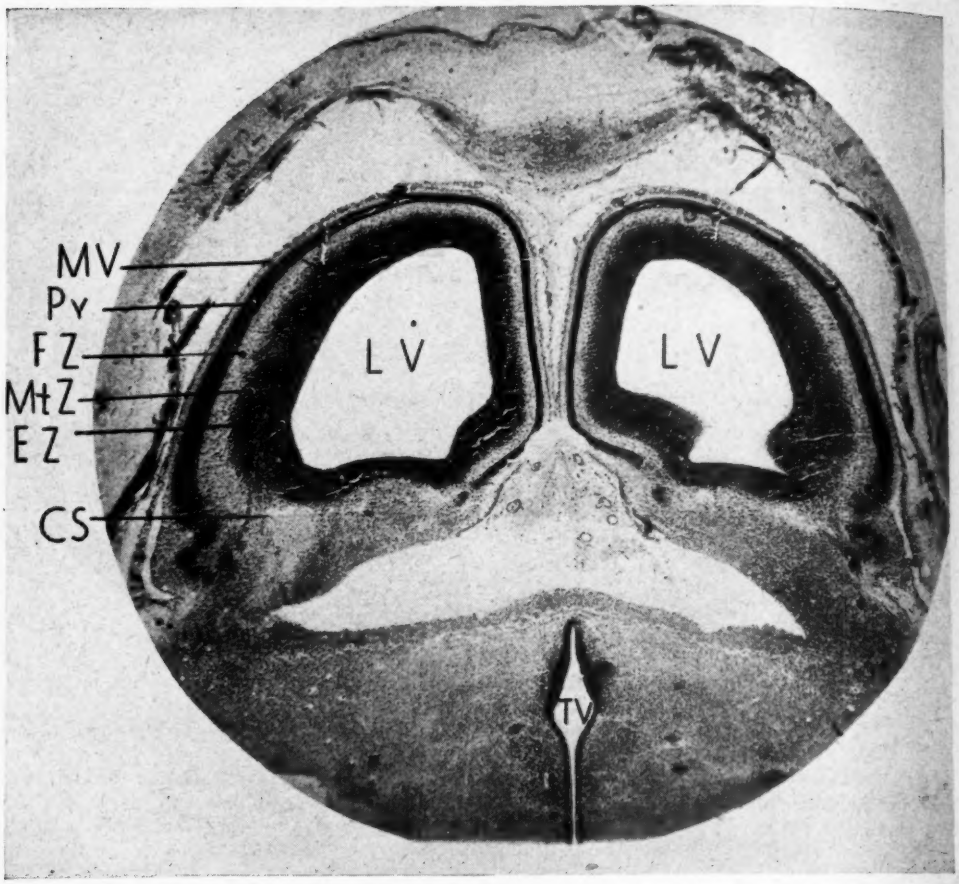

Fig. 13 (Haden). 40 mm. embryo. Section through upper part of head and through neopallium (brain wall). E Z, ependymal zone of brain wall. Mt Z, mantle zone (nuclear portion). F Z, fiber portion of mantle zone. Py, pyramidal cell layer. M V, marginal veil of His. C S, corpus striatum. T V, third ventricle. L V, lateral ventricle.

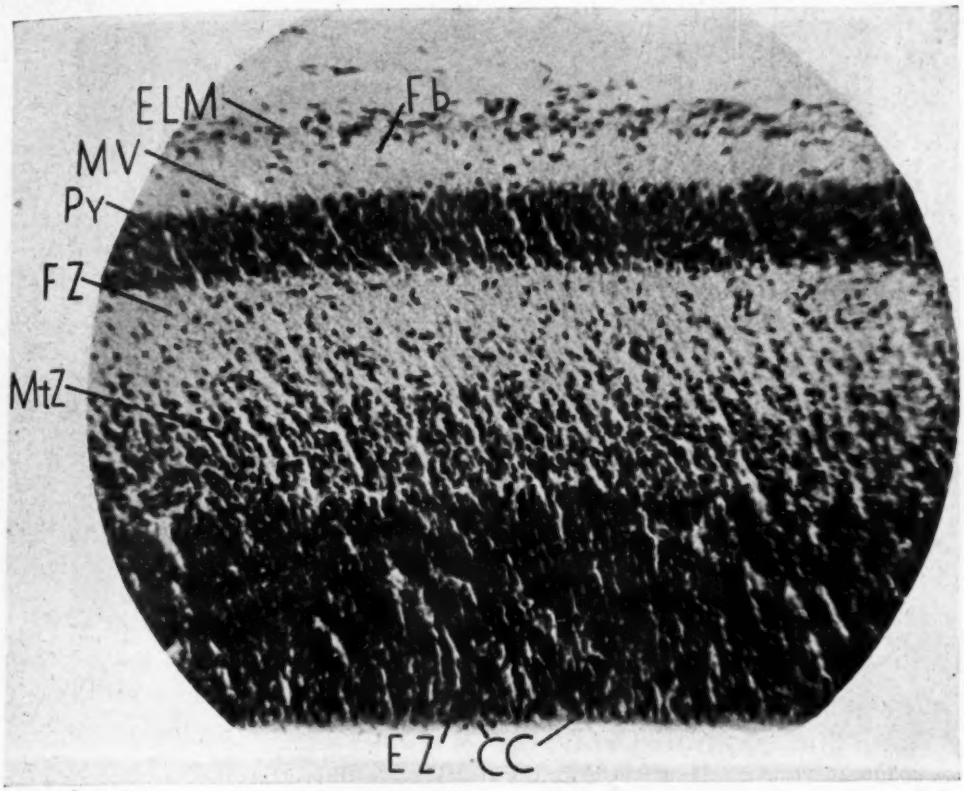

Fig. 14 (Haden). 40 mm. embryo, higher magnification of a section of brain wall in figure 13. E Z, ependymal zone. C C, cells resembling cone cells. Mt Z, nuclear portion of mantle zone. F Z, fiber portion of mantle zone. Py, layer of pyramidal cells. M V, marginal veil of His. Fb, fibers crossing M V to end in E L M, external limiting membrane.

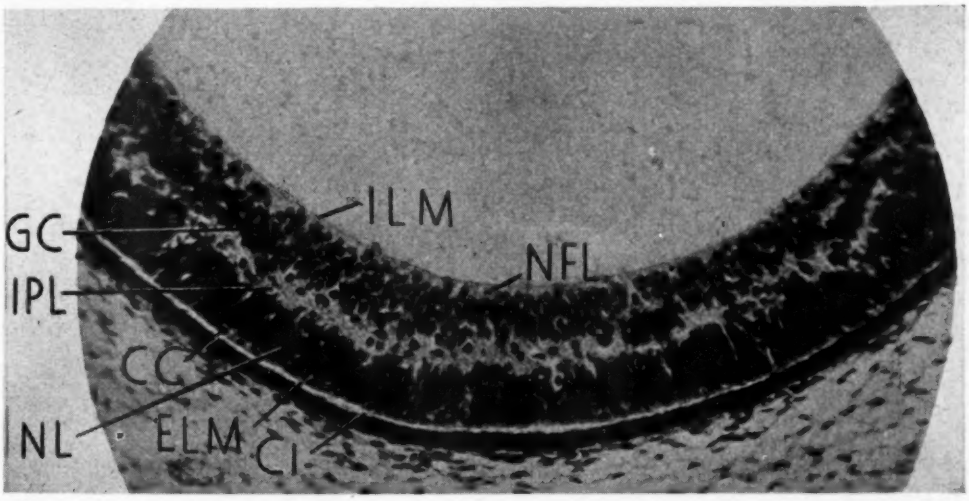

Fig. 15 (Haden). 40 mm. embryo. Section of retina of embryo in figures 13 and 14. C I, cilia. E L M, external limiting membrane. C C, cone cells. N L, nuclear layer. I P L, internal plexiform layer. G C, ganglion cell layer. N F L, nerve fiber layer. I L M, internal limiting membrane formed by foot plates of Mueller's fibers seen crossing N F L, nerve fiber layer.

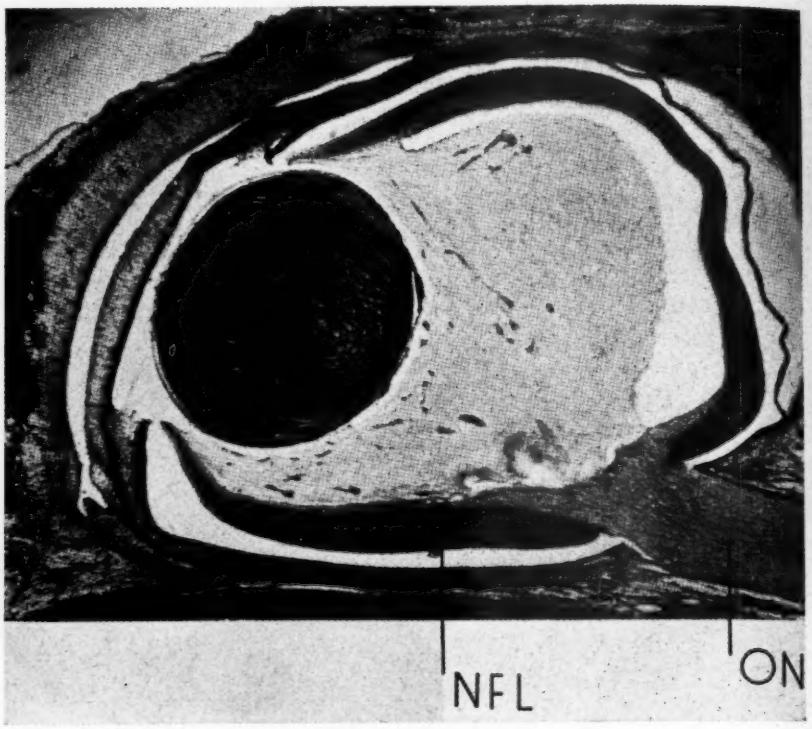

Fig. 16 (Haden). 45 mm. embryo. Horizontal section through eye. O N, optic nerve. N F L, nerve fiber layer.

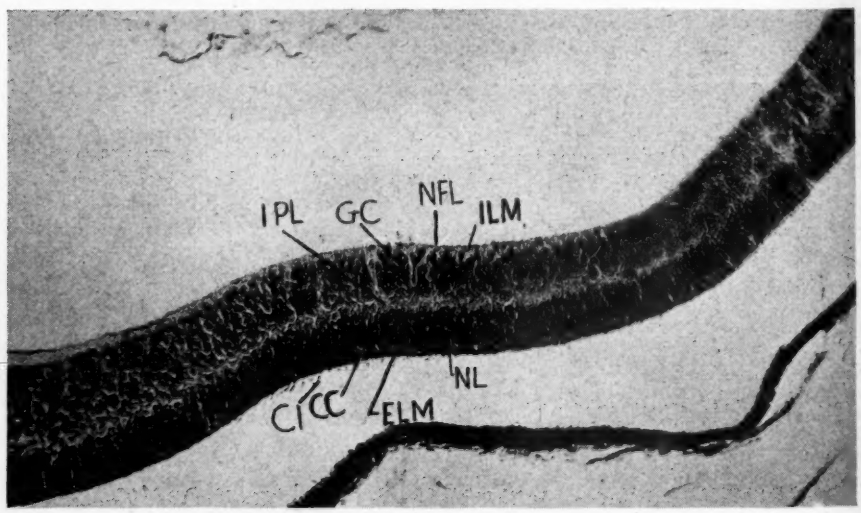

Fig. 17 (Haden). 45 mm. embryo. Higher magnification of a section of retina from temporal side of optic nerve of figure 16. C I, cilia. E L M, external limiting membrane. C C, cone cells. N L, nuclear layer. I P L, internal plexiform layer. G C, ganglion cell layer. N F L, nerve fiber layer. I L M, internal limiting membrane, formed by foot plates of Mueller's fibers, seen crossing N F L, nerve fiber layer.

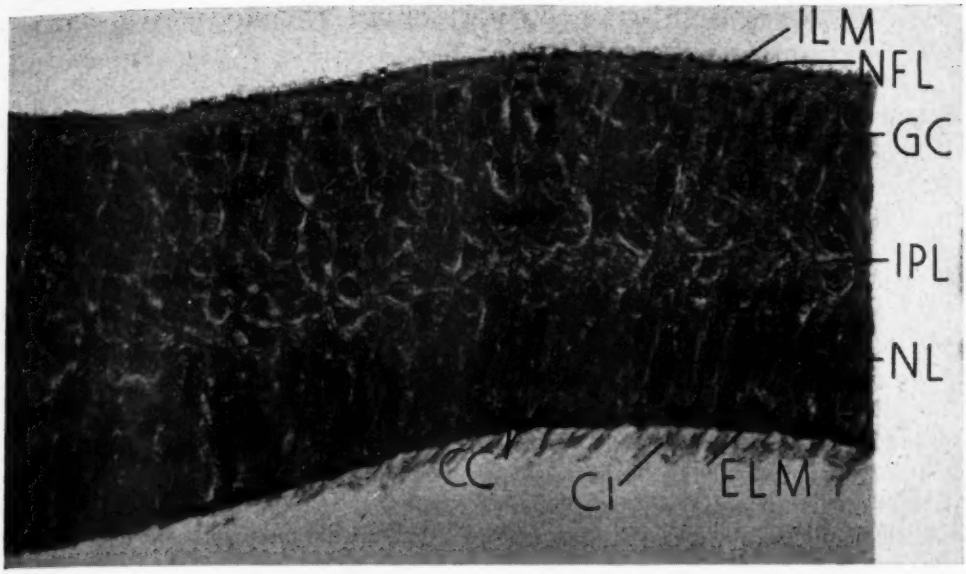

Fig. 18 (Haden). 45 mm. embryo. Higher magnification of retina near its center. C I, cilia. E L M, external limiting membrane. C C, cone cells. N L, nuclear layer. I P L, internal plexiform layer. G C, ganglion cell layer. N F L, nerve fiber layer. I L M, internal limiting membrane, formed by foot plates of Mueller's fibers—seen crossing N F L, nerve fiber layer.

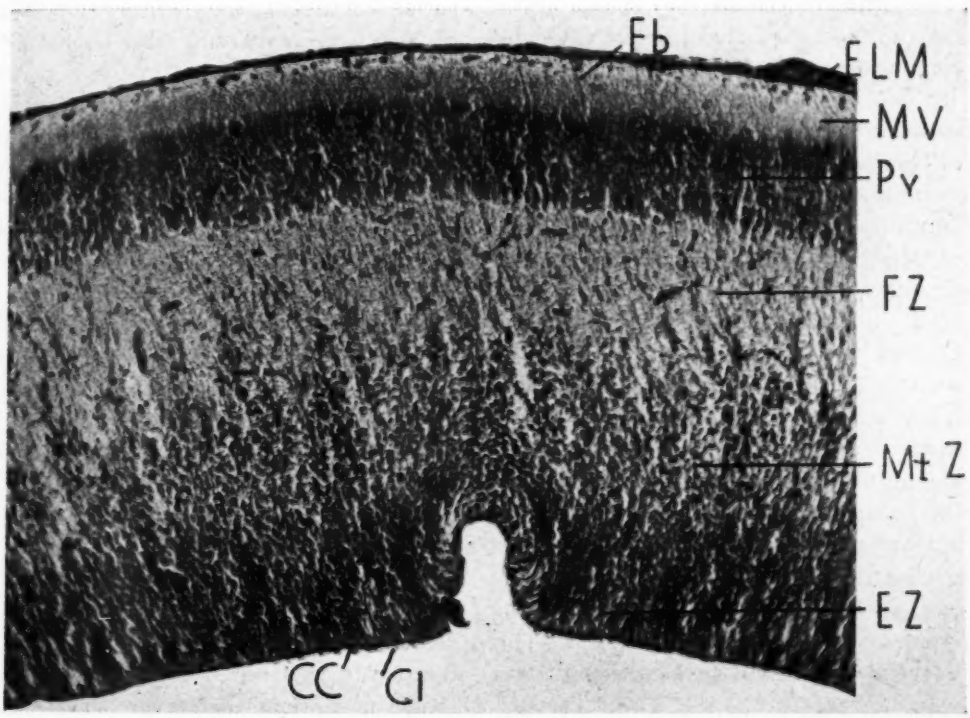

Fig. 19 (Haden). 45 mm. embryo. Section through neopallium (brain wall). C I, cilia. C C, cells resembling cone cells. E Z, ependymal zone. Mt Z, nuclear portion of mantle zone. F Z, fiber portion of mantle zone (will be definitive white matter of brain). Py, layer pyramidal cells (definitive gray matter of cortex). M V, marginal veil of His. Fb, fibers crossing M V and ending in E L M, external limiting membrane.

OCULAR COMPLICATIONS OF CERTAIN TROPICAL DISEASES*

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Many men now serving with the Armed Forces throughout the world may later seek medical attention from civilian physicians because of parasitic infections incurred in foreign service. Diseases now rare or unknown in the United States may later appear in many localities.

Fortunately, the majority of the parasitic diseases do not produce ocular complications. The five parasitic diseases which are most likely to produce ocular complications are malaria, trypanosomiasis, elephantiasis, loiasis, and onchocerciasis.

MALARIA

Malaria is an acute or chronic disease caused by a protozoan parasite (Plasmodium), characterized by chills, fever, malaise, and generalized debility. Ocular complications resulting from this disease are due to capillary thromboses, anemia, or lowered general resistance.

The most common ocular complication mentioned in standard texts is dendritic keratitis. Post,[1] in discussing the etiology of dendritic keratitis, mentioned malaria as a factor. He stated that Ellet (1889), Kipp (1890), Wilder (1893), and Charles (1904) were early investigators reporting upon this condition. Finnoff[2] called attention to malaria as a cause of dendritic keratitis and cited two cases following the use of malaria for therapy in the treatment of neurosyphilis.

During a two-year tour of duty in the tropics, dendritic keratitis was seen rarely by the author among troops suffering from a high incidence of malaria. This was likewise found to be true at other military hospitals in the same vicinity. Although there were in these cases numerous relapses, they were promptly and adequately treated; the patients were not permitted to become debilitated. This may have accounted for the low incidence of dendritic keratitis.

Townes[3] states that, during the past two years at an Army Regional Hospital, malaria has not proved to be a cause of dendritic keratitis. His cases comprised military personnel from stations both in the United States and overseas.

Maxwell[4] states that from March, 1943, to February, 1945, a total of 2,000 cases of malaria were treated at an Army General Hospital. Excluding all cases due to trauma, there were three cases of idiopathic keratitis in this entire group, two of which were chronic and one acute. During the same period, there were 48 cases of keratitis appearing among nonmalarious individuals. Of this group seven cases were considered herpetic in origin.

Neither in older literature nor in more recent clinical studies can any conclusions relative to a positive relationship between malaria and dendritic keratitis be found. It is, therefore, believed unlikely that dendritic keratitis will appear with any degree of frequency among discharged service men who may suffer subsequent relapses of malaria.

Edema of the lids, iridocyclitis, optic neuritis, paresis of the extraocular muscles, arterial emboli, thromboses of the retinal veins, and hemorrhages into the retina and vitreous have been found to complicate malaria. Intraocular hemorrhages may occur when severe anemia exists.

* Read to the St. Louis Ophthalmic Society, St. Louis, Missouri, February 23, 1945.

The more serious eye complications associated with malaria are more frequently the result of the drugs used in its treatment than of the disease itself. Atabrine has not been found to produce ocular complications. Quinine, on the other hand, may produce serious and permanent ocular complications in sensitive individuals, a small dose being sufficient to precipitate a reaction. The onset of complications may be sudden or gradual. An early ocular finding of quinine intoxication in sensitive individuals is a widely dilated pupil which is extremely sluggish or even immobile. Ophthalmoscopic study reveals evidence of edema of the retina to a varying degree, venous engorgement, and haziness of the optic disc. Later the edema and venous engorgement disappear, and a gradual narrowing of the arteries develops. The ischemia attendant upon the vasoconstriction may injure the ganglion cells of the retina to a varying degree, occasionally causing complete degeneration followed by ascending atrophy of the optic nerve. During this period there may be either a sudden or a gradual loss of central vision associated with peripheral contraction of the fields. Central vision may be recovered partially or completely following the cessation of the administration of quinine. Contraction of the peripheral fields, however, tends to be more permanent than changes in central vision.

Ocular complications from the use of quinine may be avoided by careful observation of the patient and frequent studies of the central and peripheral vision. It is obvious that the physician should be constantly on the alert for individuals who are sensitive to quinine.

Trypanosomiasis

The African variety of trypanosomiasis is an acute or chronic disease caused by a blood flagellate (*Trypanosoma gambiense* or *Trypanosoma rhodesiense*), characterized by irregular fever, skin rashes, lymphadenitis (particularly post-cervical), and subsequent numerous nervous-system manifestations, with an increasing tendency to sleep and eventual severe debility leading to death in untreated cases.

Trypanosomiasis is found in Central, West, and East Africa (fig. 1). Strong[5] states that 4 to 5 percent of the natives in some communities, and as high as 90 per-

Fig. 1 (Reeh). Africa, showing distribution of trypanosomiasis.

cent in other communities, suffer from trypanosomiasis. A report of the League of Nations shows that over one million African natives are treated for trypanosomiasis each year.

Trypanosomiasis is transmitted by the vicious day-biting tsetse fly (genus *Glossina*). The incubation period is usually two to three weeks. The first stage of the disease consists of fever, skin rashes, and enlarged lymph nodes, particularly the post-cervical group. In this stage the intermittent fever is occasionally mistaken for malaria, and antimalarial therapy is erroneously given. Later a multiplicity of central-nervous-system symptoms may develop, the principal one being an increasing tendency to sleep.

The diagnosis depends upon the demonstration of the trypanosome in the blood, in fluid aspirated from lymph glands, or in spinal fluid (fig. 2). Centrifuged specimens of blood or spinal fluid may be necessary to produce an adequate concentration for microscopic study.

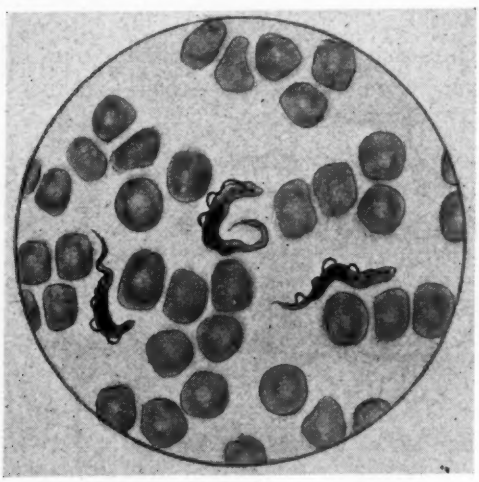

Fig. 2 (Reeh). Trypanosomes (stained blood smear).

When trypanosomes are not seen, animal inoculation with centrifuged specimens of blood or spinal fluid should be performed.

Occasionally ocular complications develop. They may be edema of the lids, interstitial keratitis, iridocyclitis, and choroiditis. Tassman[6] states that a form of interstitial keratitis which is not usually found among individuals suffering from trypanosomiasis has been reported, on occasion, in various parts of Africa. It is said to be present in as high as 30 percent of the cases. This particular type of keratitis usually appears bilaterally and results in an opacity of all corneal layers, with subsequent vascularization.

It is well to suspect trypanosomiasis routinely among individuals who have lived in Africa. The ultimate cure of the disease depends upon early, vigorous treatment aimed at eradication of the trypanosomes. In addition, the ocular complications will need specific attention.

Serious complications may result from the use of atoxyl or tryparsamide in the treatment of trypanosomiasis. In sensitive individuals there may be an early contraction of the peripheral fields, followed later by optic atrophy. When such drugs are used, frequent field studies should be made.

Filariasis

There are three types of filarial diseases that have been associated with ocular complications. They are elephantiasis, loiasis, and onchocerciasis.

Elephantiasis is a form of filariasis caused by an infestation of the lymphatic system with a threadlike roundworm, *Wuchereria bancrofti,* the male measuring 40 mm. by 0.1 mm., and the female 90 mm. by 0.28 mm.

The *Wuchereria bancrofti* (*Filaria bancrofti*) is found throughout the world in nearly all warm climates, affecting from 5 to 70 percent of the population in such localities. It is transmitted by various mosquitoes which usually bite at night.

The microfilariae, which are injected into the human by the mosquito, enter the lymphatic system and develop into adult worms. The gravid female produces microfilariae which appear in the peripheral blood vessels, principally at night when the mosquito is likely to feed. In a small percentage of cases the presence of a large number of adult worms in the lymphatic system leads to obstruction, with resulting edema of the various parts (particularly the legs, scrotum, and breasts), inflammation and secondary infection, enlargement and fibrosis of the lymph nodes, and irregular bouts of fever.

The eye is seldom involved in this dis-

ease process. Duke-Elder[7] states that there are islands in the Pacific where 90 to 100 percent of the inhabitants carry *Wuchereria bancrofti* without any evidence of intraocular complication. Nayar and Pillat,[8] Wright,[9] and Fernando[10] have, however, reported individual cases wherein the eye has been invaded by the *Wuchereria bancrofti.*

The diagnosis is based upon the history, blood smears which have been taken between 8:00 P.M. and 2:00 A.M., eosinophilia, and physical changes due to chronic lymphatic obstruction. The complement-fixation test and cutaneous test made with dog heart-worm antigen may also assist in the establishment of the diagnosis. These tests are group specific but not species specific and, therefore, are applicable in all types of filariasis.

As a general rule, medical treatment has been of little value. At the present time Anthiomaline (Merck & Co.) is being used. It reduces the number of microfilariae in the blood stream but does not affect the adult worms. Surgical intervention may become necessary to decrease the disability resulting from the edematous parts. In ocular involvement, removal of the *Wuchereria bancrofti* from the globe may be effected; however, much depends upon the size of the worm, its position in the globe, and the extent of inflammation present.

LOIASIS is a form of filariasis caused by the infestation with the *Loa loa,* commonly called the "Congo eye worm." The *Loa loa* is a threadlike roundworm, the male measuring 30 mm. by 0.3 mm., and the female 55 mm. by 0.4 mm.

Loiasis is found in West and Central Africa, especially along the Congo River and its tributaries (fig. 3). It is transmitted by a Chrysops fly (mango fly) which bites during the daytime.

During the bite of the Chrysops fly, microfilariae enter the body and there develop slowly into adults, over a period of time which may be as long as three years. Adult worms may live in the body for as long as 14 or 15 years. They migrate in the connective tissue of the host, producing symptoms when in superficial tissues,

Fig. 3 (Reeh). Africa, showing distribution of loiasis.

such as the conjunctiva, skin of the trunk, nose, eyelids, penis, and extremities. They are attracted to the surface by heat, but retreat into the deeper tissues upon exposure to cold. At times, allergic reactions occur in the skin and produce nodules the size of a hen's egg which last from three to four days. Such reactions are thought to occur during the discharge of microfilariae by the gravid female.

When the adult worm appears under the conjunctiva, considerable irritation, congestion, pain, and swelling of the lids result (fig. 4). It has been described by patients as "maddening."

Diagnosis depends upon the history, eosinophilia, presence of adult worms under the skin or conjunctiva, microfilariae in the blood stream, and positive skin and complement fixation reactions to dog heart-worm antigen. Microfilariae ap-

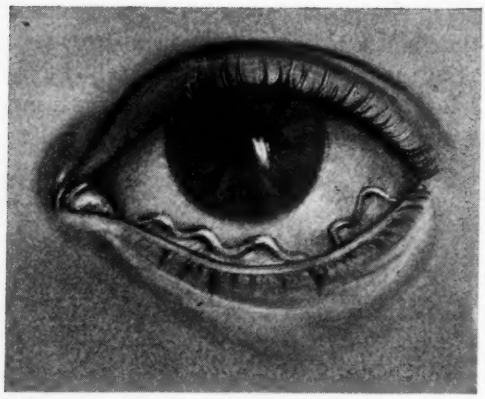

Fig. 4 (Reeh). Loa loa under the conjunctiva.

pear in the blood stream during the daytime.

Gifford and Konne,[11] and Cregar and Burchell[12] each reported a case in which an adult *Loa loa* was removed from under the bulbar conjunctiva.

The adult worm is extremely active and difficult to remove. When discovered under the conjunctiva, the eye should be carefully anesthetized, preferably with cocaine. The worm should then be grasped with a forceps, and a silk suture passed under it and tied before removal is attempted. If, on the other hand, the worm is molested, it will disappear into deeper structures without delay. The use of drugs is ineffective. Removal of the adult worms is the only successful treatment.

Fig. 5 (Reeh). Africa, Southern Mexico, and Guatemala, showing distribution of onchocerciasis.

ONCHOCERCIASIS is a form of filariasis caused by an infestation with *Onchocerca volvulus*, and characterized by multiple subcutaneous nodules with secondary disturbances of the skin and eyes.

The *Onchocerca volvulus* is a thread-like roundworm, the male measuring 18 to 30 mm. by 0.15 mm., and the female

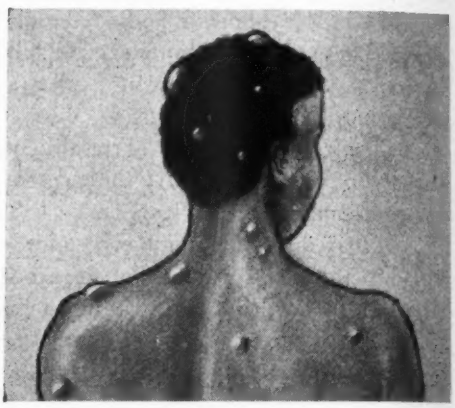

Fig. 6 (Reeh). Onchocerciasis, showing subcutaneous nodules.

330 to 500 mm. by 0.4 mm. It is transmitted by a vicious, blood-sucking Simulium fly (black gnat or coffee gnat) which bites during the daytime.

Onchocerciasis occurs in West and Central Africa, and on the Pacific slopes of Southern Mexico and Guatemala, at an elevation of between 2,000 and 4,000 feet in the excellent coffee-growing areas (fig. 5). Duke-Elder[7] states that 40 to 100 percent of the native population of endemic areas are infested with this worm. Inhabitants of whole villages have been found to be blind from this cause. It is estimated that in some provinces of

the Belgian Congo, 10 percent of the entire population are blind from onchocerciasis. It has, therefore, rightfully been called the "blinding filarial disease."

Subcutaneous nodules appear in from 2 to 12 months after the bite of the infected fly (fig. 6). These nodules are firm, movable, grayish-white in appearance, and measure from 6 to 60 mm. in diameter. Adult filariae and microfilariae are found in the nodules. The gravid female releases microfilariae into the subcutaneous and adjacent tissue and into the lymphatics. Rarely are microfilariae found in the blood stream. In African cases the nodules develop principally on the trunk and extremities, whereas in Mexican and Guatemalan cases they are found principally on the head and shoulders.

Ocular complications develop after five or six years, especially when the nodules are located on the head and shoulders. The nodules may be confused with sebaceous cysts. The presence of microfilariae in the fluid aspirated from the nodules, or in tissue of an excised nodule or biopsy specimen, establishes the diagnosis. Examination of a thin slice of skin may also uncover the parasite. The history may lead one to suspect this condition. Eosinophilia and positive skin and complement-fixation tests may be of value.

The microfilariae are frequently noted entoptically by the patient. Estrada[13] reported that before inflammatory signs were prominent, microfilariae were noted in both the aqueous and vitreous of patients suffering from onchocerciasis, but were seen more often in the vitreous. The microfilariae were phototactic, tending to move away from the light beam. He examined the aqueous with a slitlamp, and the vitreous with an ophthalmoscope, using a plus 20D. to 40D. or 50D. lens. The patients were placed in a dark room for a short period prior to examination.

Conjunctivitis develops frequently. The cornea is also frequently involved, punctate deep infiltrations appearing at first, later increasing in number and coalescing to form large plaques. This is followed by vascularization. Iridocyclitis usually accompanies the keratitis. Choroiditis and optic neuritis, with subsequent optic atrophy, are also found as ocular complications. Blindness results from the opacification of the cornea and the marked inflammation of the uvea and optic nerve. Scott[14] reported two cases of onchocerciasis with a transient ocular complication characterized by unilateral edema of the upper lid, proptosis, ciliary flush, and edema of the optic disc. He explained the condition on the basis of an anaphylactic edema produced in the orbit as a result of *Onchocerca volvulus* toxins.

The use of drugs is not particularly helpful. Prompt and complete excision of all subcutaneous nodules is the proper treatment. Ocular complications are treated specifically, depending upon the extent and the nature of the inflammation.

Summary

After the present war physicians may encounter tropical diseases which are rare or unknown in the United States. These will be found in men who have served in the Armed Forces overseas or among individuals who will travel more extensively because of the vast postwar development of highways and airlines. Any one ophthalmologist will see an extremely limited number of cases, however. Fortunately, ocular complications are found to occur in only a few of the many tropical diseases.

Malaria is believed to be one of the causes of dendritic keratitis. At the present time clinical observations are not conclusive. The true etiologic basis is still vague. Other ocular complications of malaria are rare. The more serious complications result from the administration

of quinine to sensitive individuals.

African trypanosomiasis will probably always be extremely rare in the United States; however, the final outcome in untreated cases is so disastrous that it is well for all physicians to be on the alert.

Filarial diseases are extremely common in various parts of the world. Despite the widespread existence of the *Wuchereria bancrofti*, cases of entrance of this worm into the globe are rare. The adult *Loa loa* lives in the body for many years. It wanders freely about in connective tissue, frequently appearing beneath the skin of the lids or conjunctiva, hence the old name of *Filaria oculi*. It does not tend to enter the globe itself, however. The *Onchocerca volvulus*, on the other hand, is destructive to the eye. The microfilariae enter the layers and chambers of the eye readily, producing inflammation which not infrequently results in blindness. Onchocerciasis may prove to be more troublesome in the future because of increased travel into areas of Mexico and Guatemala where the disease is endemic.

Conclusions

1. Certain tropical diseases produce ocular complications.

2. Such ocular complications may be improperly evaluated and inadequately treated because of failure to recognize the causative disease.

AAF School of Aviation Medicine.

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JUVENILE DISCIFORM DEGENERATION OF THE MACULA*

Report of 10 cases. Pathologic findings

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In 1930, Junius[1] described four cases of juvenile macular exudative retinitis, a form of macular degeneration somewhat similar to senile disciform degeneration of the macula. Since then surprisingly few additional reports have been published dealing with this disorder. I believe this is due, not so much to the rarity of the condition, as to the fact that the disease has been considered as an ordinary central choroiditis. Some of the reports which have been published subsequent to Junius's article are those of Davis and Sheppard,[2] Verhoeff and Grossman,[3] and Gifford and Cushman.[4] More recently Adler and Scarlett[5] reported three similar cases under the title of juvenile macular exudative chroiditis. In this article are to be found further references to pertinent literature. The term "juvenile disciform degeneration of the macula" was applied to the condition by Verhoeff and Grossman, in connection with senile macular degeneration, for the sake of convenience. This term seems quite adequate, since both forms of degeneration appear to be closely related.

At present juvenile disciform degeneration is of significance mainly because it may be confused with malignant melanoma. However, when more is known about its etiology and pathogenesis, it will no doubt create greater interest and assume added importance.

So far no pathologic reports on juvenile disciform degeneration, as such, have been made. There are, however, on record three reports which may well represent the histologic picture of this condition. First of these is that of Verhoeff and Grossman[3] who presented the histologic findings from a case in a man aged 63 years which appeared and behaved clinically like the juvenile type. Sections revealed a subretinal exudate of serum half of which was confined beneath the pigment epithelium, raising it from Bruch's membrane in the form of a vesicle. A small amount of hyaline connective tissue was present at one side of the vesicle. Bruch's membrane showed two small breaks through which fibroblasts and capillaries passed. The choroid contained a few lymphocytes. The retina was normal and the retinal, choroidal, and posterior ciliary vessels were free from endovasculitis. These findings suggested to the authors that such a serous exudate may be the cause of juvenile disciform degeneration. Their suspicion is strongly supported by the histologic findings in one of the cases here reported.

The second report is that of Terry[6] who, discussing Verhoeff and Grossman's paper, presented sections obtained from a similar ocular lesion in a man 29 years of age. The pathologic picture was apparently of the same nature as in the senile form, with the presence of blood in and around the mound, but without arteriosclerosis. The adjacent area of the choroid was infiltrated with lymphocytes. Third is that of Gifford and Cushman,[4] who showed sections obtained from a case in a man also 29 years of age in which

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* The opinions and views set forth in this article are those of the writer and are not to be considered as reflecting the policies of the Navy Department. From the Ophthalmological Service, U. S. Naval Hospital, San Diego, California. Read before the joint staff conference. November 2, 1944.

there was a mass measuring about 3 mm. in extent, situated between the retina and the lamina vitrea. The mass consisted in part of the thickened retina containing large areas of cystic degeneration and a layer of closely packed fibrillar spindle cells. Much of the mass was formed by proliferated pigment-epithelial cells. The lamina vitrea varied in thickness, and it showed two defects through one of which a small vessel passed from the choriocapillaris into the mass. The retinal and choroidal vessels showed no sclerotic changes.

Between August, 1942, and September, 1944, 10 cases of macular disease, which I believe fall under the classification of juvenile disciform degeneration, were seen at the U. S. Naval Hospital in San Diego, California. Nine of the patients were admitted to the Hospital and one was seen in the clinic as an outpatient. All the patients were white men between the ages of 19 and 37, and in the active service of the Navy. In four of the men the right eye was affected, in five the left eye, and in one, both eyes. One of the cases was mistaken for malignant melanoma, consequently a specimen was obtained for histologic study. The lesions were invariably located in the macular area; they were elevated and roughly circular in shape, with vessels coursing in front of them. Their size varied approximately from 0.5 to 3 disc diameters, and their color from dark-brown to gray. The lesions were usually surrounded by subretinal edema, deep and superficial hemorrhages, and, in three of the cases, by whitish exudates. As the disease progressed, old hemorrhages would become absorbed and new ones would appear. Save for the presence of mild retinal vascular sclerosis in some of the patients, the fundi appeared otherwise normal. No inflammatory reactions, such as turbidity of the vitreous, cells in the anterior chamber, or keratitic precipitates were observed in any of the affected eyes. Visual acuity varied from 20/20 to 4/200. No associated abnormalities believed to be of etiologic significance were found present in any of the patients.

The treatment varied somewhat with the individual patient. Some of the patients were given typhoid vaccine by vein, while others received sodium nitrite and nicotinic acid. Most of the patients also received multiple vitamins and some were given ascorbic acid. Sulfathiazole was tried in one of the patients. Foci of infection were removed whenever indicated. All treatment was of little value except in the case of one patient (case 8) wherein the administration of sodium nitrite and nicotine acid seemed to be of benefit.

Report of cases

Case 1. M. S., a fireman third class, aged 20 years, entered the Hospital on August 6, 1942, complaining of blurred vision in the left eye. Six weeks before, while on watch aboard ship, he had suddenly discovered that the vision in the left eye was blurred, and it had gradually become worse since then.

Physical examination disclosed a blood pressure of 132 systolic and 96 diastolic. Except for chronic tonsillitis, no other evident foci of infection were present. Roentgenograms of the chest revealed no pathologic changes. A complete blood count and urinalysis showed no abnormality. The Kahn test of the blood, complement-fixation test for gonorrhea, and agglutination test for brucellosis gave negative results. There was a moderate reaction to tuberculoprotein (second strength P.P.D.).

Ocular examination. The right eye was normal, with vision of 20/20. Vision in the left eye was 20/30. The media of the left eye were clear; the optic disc was well defined and of normal color. The macular area (somewhat similar to that in figure

6) presented a deeply pigmented, grayish, disciform, elevated lesion slightly larger than the discs, with hemorrhages in and around it and surrounded by deep edema. Several blood vessels coursed in front of it. The rest of the fundus and anterior segment of the eye were normal. There was an absolute central scotoma corresponding to the lesion.

Tonsillectomy was performed shortly after the patient's admission to the Hospital. He remained in the Hospital approximately six months, during which time he was given typhoid vaccine intravenously and large doses of vitamins A and B complex, orally, but without apparent benefit. Vision, at first, was gradually reduced to 20/200 and then it slowly improved to 20/50. Hemorrhages, in and around the lesion, would disappear, only to reappear a few days later. At the time of discharge from the Hospital, no hemorrhages were present but the lesion was of about the same size as on admission and vision was 20/50.

CASE 2. L. J. H., a seaman second class, aged 19 years, entered the Hospital on November 2, 1942, because of blurred vision and slight pain in the right eye. Vision had become suddenly impaired nine days before, and since then he had gradually developed a dull pain in this eye.

Physical examination revealed a blood pressure of 120 systolic and 80 diastolic. The tonsils were enlarged and infected. The blood count was 10,350 white cells with 79 percent polymorphonuclears and 21 percent lymphocytes. The Kahn test of the blood, complement-fixation test for gonorrhea, and agglutination test for brucellosis gave negative results. Tuberculin test (second strength P.P.D.) gave a positive reaction. Roentgenologic examination of the chest showed no pathologic changes.

Ocular examination. Vision in the right eye was 20/60, and in the left, 20/15. The left eye was entirely normal. External structures, anterior chamber, iris, pupil, and lens of the right eye were normal. The vitreous was clear. Examination of the fundus showed the optic disc and retinal vessels to be normal. The

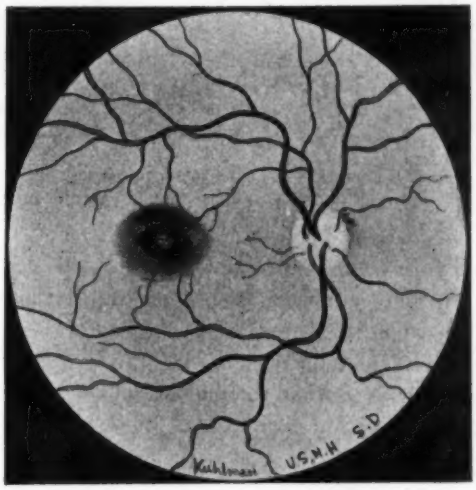

Fig. 1 (Lucic). Case 2. Ophthalmoscopic appearance of the right eye approximately six months following the onset of the disease; vision 4/200.

macular region presented an irregular, horizontally ovoid, dark-gray, elevated lesion, about one half the size of the disc, with vessels running over it and surrounded by a circular area of deep edema. No hemorrhages nor white spots were present. The fundus, otherwise, appeared normal. A corresponding central scotoma was present.

Tonsillectomy was performed shortly after the patient's admission to the Hospital. During the course of treatment, he was given typhoid vaccine intravenously, sulfathiazole orally, and large doses of multiple vitamins, without benefit. During the ensuing four months of daily observation, no hemorrhages were seen and vision varied between 20/40 and 20/200.

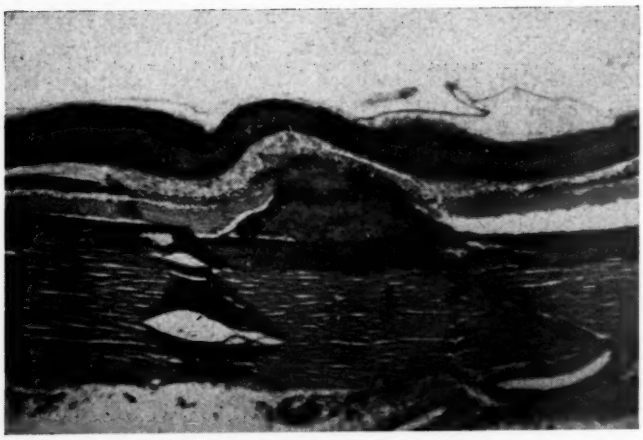

Fig. 2 (Lucic). Case 2. Photomicrograph of a section showing moundlike mass of tissue and serum exudate (×20).

There was no apparent change in the size of the lesion but it became darker and the center acquired an amber color.

The patient was allowed to go home and was not seen for 40 days. On his return, vision was 4/200. The lesion (fig. 1) was slightly larger, darker, and more elevated. It presented a central, opaque-white area in which small new blood vessels were visible. No hemorrhages were present. A diagnosis of malignant melanoma was made and the eye was enucleated on April 14th, approximately six months after the onset of the disease.

Pathologic examination. The eye was normal except for the lesion in the macular area (fig. 2). The elevation of the retina was due to a moundlike mass of tissue, measuring 0.9 mm. in length and 0.3 mm. in height, which was surrounded by serum exudate extending about 1 mm. beyond the borders of the mass. The mass (fig. 3) was made up

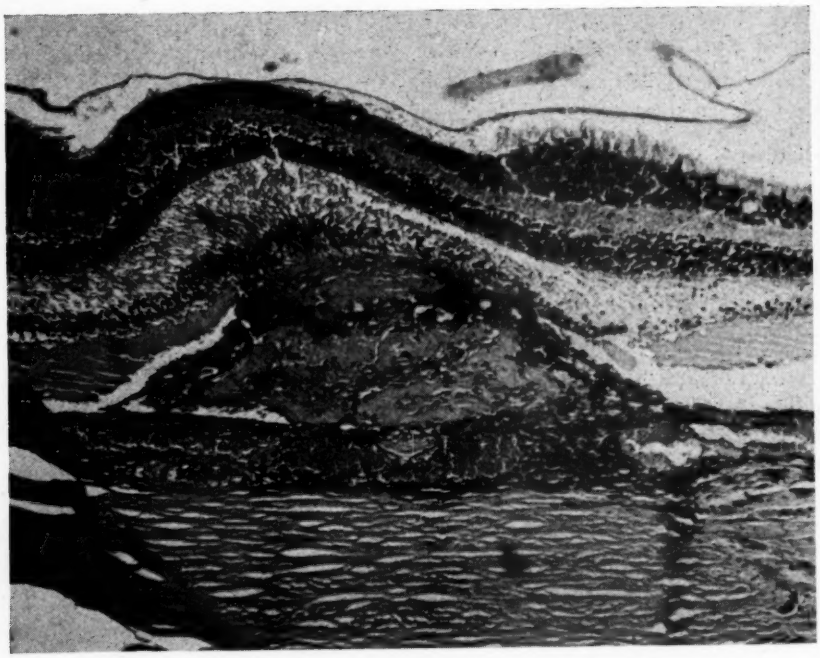

Fig. 3 (Lucic). Case 2. Higher-power magnification of the same section shown in figure 2 (×50).

mostly of hyaline connective-tissue cells and a few proliferated pigment cells, among which were a few fine blood vessels. The pigment epithelium was lifted up so as completely to surround the main mass except at its summit, where it was flattened out, and the new tissue extended beyond the pigment layer to come in contact with the neuroepithelium. The raised portion of the pigment epithelium was made up of several layers of swollen cells. A new layer of pigment cells had begun to proliferate at the base, especially on the nasal side. This produced the picture of two distinct layers of pigment epithelium, enclosing between them the main portion of the new tissue. The lamina vitrea was ruptured in at least two places, through which connective-tissue cells from the choroid extended into the mass. The choroid was twice as thick in the area of the lesion as elsewhere in the eye and it showed lymphocytic infiltration which was particularly heavy in one of the sections. The rods and cones were completely destroyed over the entire extent of the lesion, including the area of serum exudate. The rest of the retina appeared normal save for some edema of the internuclear layer. The retinal and ciliary vessels appeared normal. The choroidal vessels in the region of the lesion were dilated and the arteries showed considerable thickening of their muscular walls. The optic disc appeared normal.

CASE 3. J. R. T., a chief machinist's mate, aged 35 years, entered the Hospital on May 3, 1943, complaining of blurred vision in the left eye, photophobia, and frontal headaches. He had first experienced blurring of vision in the left eye, suddenly, approximately five months before, while aboard ship. Since then vision had become somewhat improved, but he developed frontal headaches and photophobia. He complained of no symptoms referable to the right eye.

Physical examination revealed blood pressure of 130 systolic and 70 diastolic.

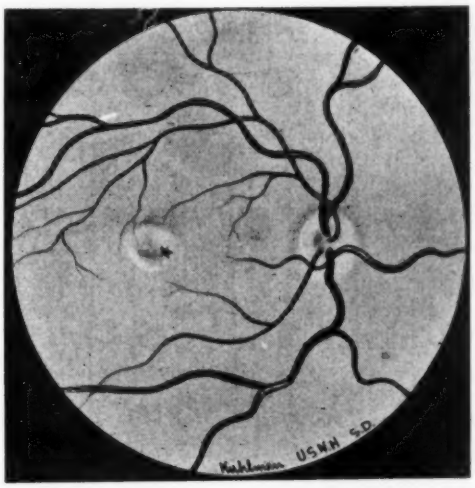

Fig. 4 (Lucic). Case 3. Ophthalmoscopic appearance of the right eye on first admission (May, 1943) showing an old, nonelevated lesion; vision 20/20.

Special examinations disclosed the presence of four alveolar abscesses with extensive pyorrhea, and a focus of infection in the prostate gland. Roentgenograms of the chest revealed no pathologic changes. The Kahn test of the blood, complement-fixation test for gonorrhea, and agglutination test for brucellosis gave negative results. Tuberculin test (second strength P.P.D.), gave a strongly positive reaction. The blood count was within the normal limits, and urinalysis disclosed no pathologic changes.

Ocular examination. Right Eye. Vision was 20/20. External structures, anterior chamber, iris, pupil, lens, and vitreous were normal. Examination of the fundus (fig. 4) showed the optic disc and the retinal vessels to be normal. Just temporal and slightly superior to the fovea was an irregular, grayish-white, nonelevated le-

sion about three quarters the size of the disc with several vessels coursing in front of it. Its center presented a clump of pigment; its borders were irregular and free from pigment. There was no edema of the surrounding retina. When viewed with the binocular ophthalmoscope, the lesion appeared to be behind the retina. The rest of the fundus was normal.

Left Eye. Visjon was 20/30. The external structures and the condition of the

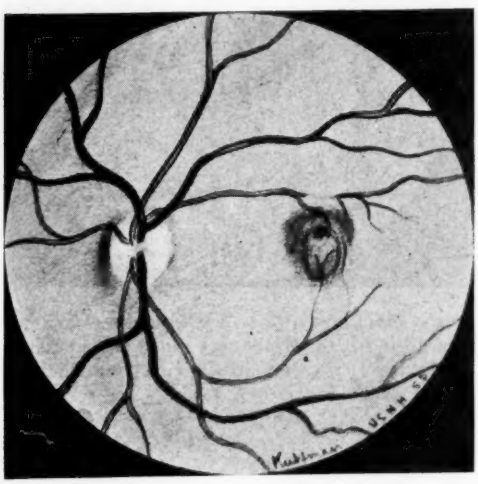

Fig. 5 (Lucic). Case 3. Ophthalmoscopic appearance of the left eye on first admission (May, 1943); vision 20/30.

media were similar to those noted in the right eye. Examination of the fundus disclosed the nerve head to be normal. The macular region (fig. 5) presented an elevated, dark-gray, lenticular lesion with sharp borders, about three quarters the size of the disc, with a small, grayish center and surrounded by a small area of subretinal edema. Two thirds of the superior portion of the lesion was surrounded by a deep, horseshoe-shaped hemorrhage, and a small flame-shaped hemorrhage was present on its superior edge. Two retinal vessels coursed in front of the lesion. One large branch of the superior temporal artery showed a local, slight constriction, just above the lesion.

Shortly after hospitalization the affected teeth were extracted. The focus in the prostate gland was eliminated by massage. The patient was given typhoid vaccine intravenously and multiple vitamins orally, with no apparent influence on the lesion or vision. Between April 26th and July 19th, vision varied between 20/40 and 20/200. Superficial hemorrhages would gradually disappear only to reappear a few days later. The deep, horseshoe-shaped hemorrhage gradually extended downward until it encircled almost the entire lesion. By August 20th, most of the superficial and part of the deep blood had disappeared, and the lesion was smaller. Vision on this date was 20/30. On September 4th, a fresh, small, superficial hemorrhage was present at the superior border of the mound, but no deep-seated blood was visible. Vision on this date was 20/50. On September 15th, vision was 20/30, and the superficial hemorrhage was smaller. The patient was given 40 days' leave. On his return from leave, vision in the left eye was 20/30; the lesion had not changed in size and elevation but it was lighter in color. There were a few small hemorrhages at the upper border which became absorbed during the next few days. On November 17th, vision in the right eye was 20/20 and in the left eye, 20/30, when the man was discharged from the Hospital.

He was readmitted to the Hospital on April 4, 1944, now complaining of blurred vision in both eyes.

Vision in the right eye was 20/70. Besides the already described lesion, the right eye presented (fig. 6) a new, grayish, elevated lesion about the size of the disc, located inferior and nasal to the macula, surrounded by deep edema and a few superficial hemorrhages. Several vessels passed in front of it. The temporal arteries exhibited a strong pulsation, and

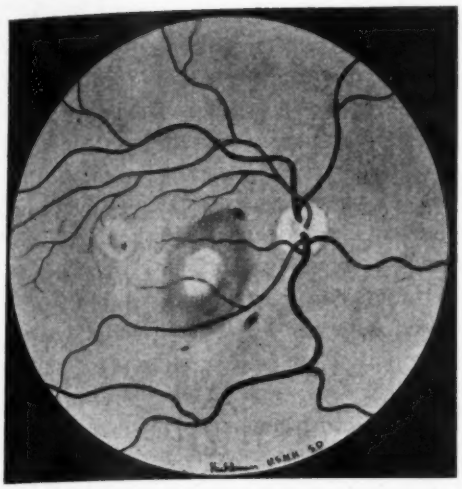

Fig. 6 (Lucic). Case 3. Ophthalmoscopic appearance of the right eye on second admission (April, 1944) showing a new lesion and constriction of one vessel; vision 20/70.

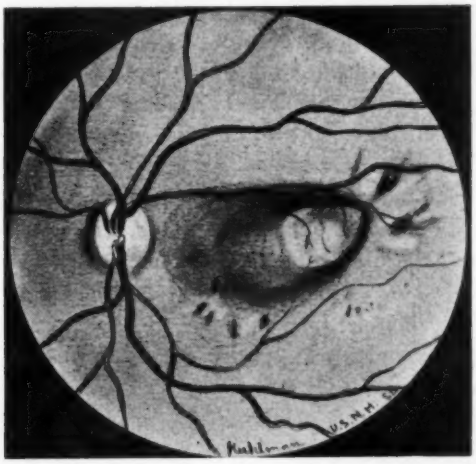

Fig. 7 (Lucic). Case 3. Ophthalmoscopic appearance of the left eye on second admission (April, 1944) showing recurrence of the lesion and vascular constrictions; vision 10/200.

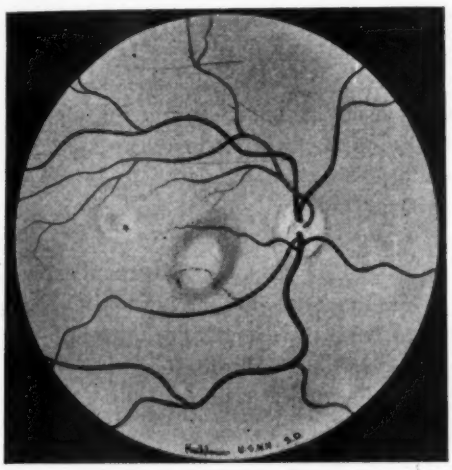

Fig. 8 (Lucic). Case 3. Ophthalmoscopic appearance of the right eye in August, 1944; vision 20/30.

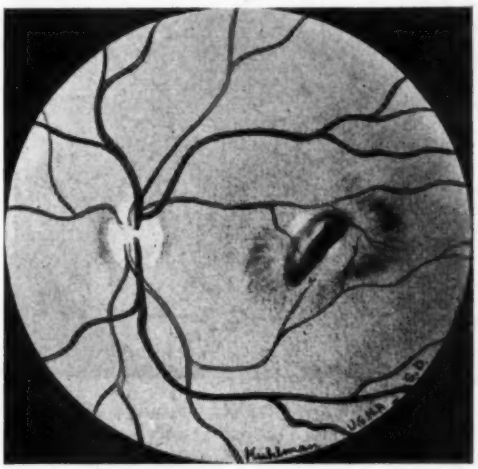

Fig. 9 (Lucic). Case 3. Ophthalmoscopic appearance of the left eye in August, 1944; vision 20/60.

one small branch of the inferior temporal artery, which passed over the lesion, was constricted. Vision in the left eye was 10/200. The macular area of the left eye (fig. 7), presented a highly elevated, grayish lesion about three times the size of the disc, with several vessels in front of it and surrounded by superficial hemorrhages, few white exudates, and by a large area of subretinal edema. One artery which coursed just superior to the lesion and which had shown slight constriction on previous admission, now was more markedly constricted. A large branch of the inferior temporal artery was also constricted. All the larger

arteries pulsated strongly.

The blood pressure was 128 systolic and 68 diastolic. A careful physical examination disclosed nothing of significance except for a positive capillary resistance test.

During the next five months of observation and treatment with ascorbic acid and sodium nitrite, vision improved to 20/30 in the right eye and 20/60 in the left. The lesions changed in appearance approximately as shown in figures 8 and 9.

CASE 4. R. R. S., a warrant officer, aged 33 years, was seen as an outpatient on September 29, 1943, through the courtesy of Dr. Windsor S. Davies, under whose care he had previously been at another U. S. Naval Hospital. Transcript of his medical records showed that on December 30, 1942, he was examined for promotion to warrant officer, at which time vision was recorded as 20/30 in the right and 20/20 in the left eye. On February 10, 1943, he was admitted to a Naval Hospital because of blurred and distorted vision in the right eye of which he accidentally became aware when he happened to rub his left eye. At that time vision in the right eye was 20/100, and 20/20 in the left eye. The right eye presented an oval, elevated, mottled, dark lesion just superior and temporal to the fovea about three-fourths disc diameter in size. There were fresh hemorrhages along its temporal border, and it was surrounded by marked edema which extended into the foveal region. Physical examination revealed nothing of importance. Roentgenograms of the chest disclosed no pathologic changes, and no foci of infection were present. There was a mild reaction to tuberculoprotein. At the time of discharge from the Hospital, on June 11th, vision in the right eye was 20/30.

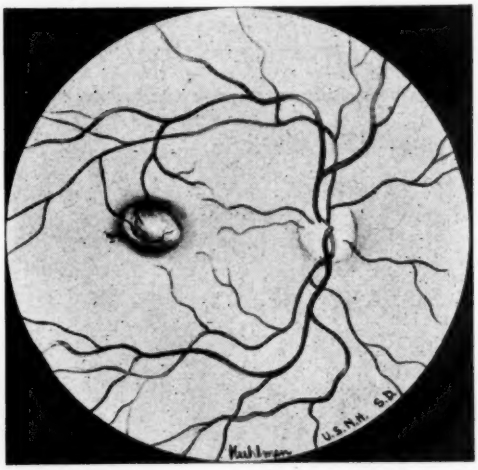

Fig. 10 (Lucic). Case 4. Ophthalmoscopic appearance of the right eye about seven months following the onset of the condition; vision 20/50.

On September 29th, vision in the right eye was 20/50 and in the left eye 20/20. The left eye was normal. The right eye presented (fig. 10), a dark, elevated, ovoid lesion about three-fourths the size of the disc, located just superior and temporal to the macula. The center of the lesion was of an amber color, and two blood vessels coursed in front of it. There was an area of subretinal edema surrounding the lesion but no hemorrhages were present. The rest of the fundus and the anterior segment of the eye appeared normal.

CASE 5. V. G. C., a seaman, first class, aged 37 years, entered the Hospital on January 11, 1944, complaining of gradual diminution of vision in the right eye and distortion of objects, for the preceding four weeks.

Physical examination revealed a blood pressure of 118 systolic and 78 diastolic. The tonsils were absent. All the teeth had been extracted in 1936 because of pyorrhea. Roentgenograms of the chest showed an area of calcification, about

3 cm. in diameter, in the posterior portion of the left upper lobe. There was a mild allergic reaction to tuberculoprotein (first strength P.P.D.). The Kahn test of the blood, agglutination test for brucellosis, and a complement-fixation test for gonorrhea gave negative results. The capillary-resistance test produced numerous petechiae in three minutes.

Ocular examination. Vision in the right eye was 20/200. This eye presented (fig. 11) a dark-greenish, ovoid, elevated lesion in the macular area about three-fourths disc diameter in size, surrounded by an area of subretinal edema, with vessels coursing over it. The center of the lesion was of amber color, its borders were distinct, and several small hemorrhages were present at its upper temporal and inferior nasal borders. The retinal arteries pulsated strongly; they were unduly tortuous, their reflexes were wide and soft, and mild arteriovenous compressions were present along the temporal vessels. The optic disc and the rest of the fundus appeared normal. A corresponding central scotoma was present. The left eye was normal save for vascular tortuosities and arteriovenous constrictions similar to those in the right eye. Vision in the left eye was 20/20.

Under the administration of typhoid vaccine, multiple vitamins, and ascorbic acid some of the hemorrhages became absorbed within a few weeks, only to recur shortly after. On March 1st, vision in this eye was 20/200, and several hemorrhages were present, especially at the lower nasal border; the shape and size of the lesion had not changed. On March 18th, a new, large hemorrhage was present at the inferior temporal border which extended to the central portion of the lesion within the next 10 days. On May 16th, vision was still 20/200. Under intravenous administration of sodium nitrite vision improved to 20/70, but no apparent change occurred in the lesion and hemorrhages continued to recur.

CASE 6. J. E. B., a machinist's mate, second class, aged 30 years, entered the Hospital on February 25, 1944, primarily

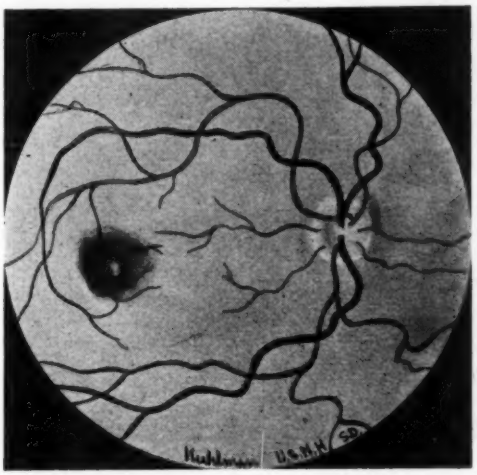

Fig. 11 (Lucic). Case 5. Ophthalmoscopic appearance of the right eye; vision 20/200.

because of pain in the back, dysuria, and hematuria of one month's duration. He also complained of impaired vision in the left eye which he had noticed for four years.

Physical examination disclosed a blood pressure of 126 systolic and 72 diastolic. The teeth, throat, sinuses, and prostate gland were normal. The Kahn test of the blood and agglutination test for brucellosis gave negative reactions. Cystoscopic and roentgenologic examinations revealed a large calculus in the left kidney. Nephrectomy was performed on February 29, 1944, and multiple, hard, black, rough calculi were found in the intrarenal pelvis and calyces. The patient made a normal recovery.

Ocular examination on May 3, 1944, revealed a normal right eye with vision

of 20/20. The left eye (fig. 12) presented a round, yellowish-gray, slightly elevated lesion in the macular area, about three quarters the size of the optic disc, whose edges were irregularly serrated and surrounded by an area of degeneration. Many small vessels and few clumps of

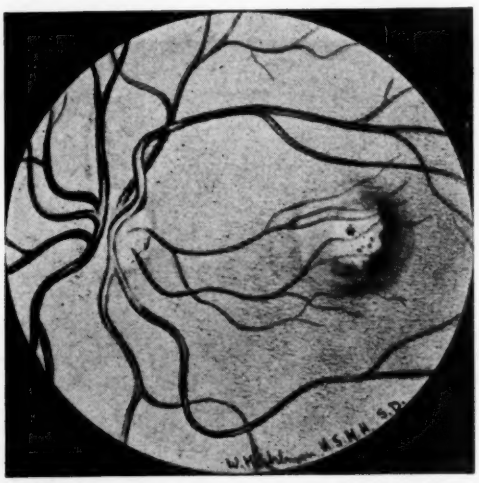

Fig. 12 (Lucic). Case 6. Ophthalmoscopic appearance of the left eye approximately four years after onset; vision 20/200.

black pigment were present in the lesion. Several blood vessels coursed in front of it. No hemorrhages were present. The edges of the optic disc were irregular. The rest of the fundus and the retinal vessels appeared normal. Vision in this eye was 20/200, and there was a corresponding central scotoma.

CASE 7. D. H. L., a lieutenant, U.S.N.R., aged 35 years, entered the Hospital on April 16, 1944, because of distorted and blurred vision in the left eye. Two months previously, while he was writing, vision in the left eye became suddenly distorted, and there was a dark shadow above the letters. The patient was seen by an ophthalmologist approximately two weeks later, at which time vision in each eye was 20/20 and there were two small hemorrhages just below the macular area of the left eye "with question of an early active area of choroiditis." He was seen by another ophthalmologist about two weeks later at which time vision was 20/30 in the left eye and there was an "active area of chorioretinitis" in the macular area of the left eye.

Physical examination revealed a blood pressure of 132 systolic and 90 diastolic. The tonsils were absent. The teeth, sinuses, and prostate gland were normal. The blood count showed approximately 5,000,000 red cells and 8,500 white cells, with 65 percent segmented neutrophiles and 30 percent lymphocytes. Platelet count was 250,000. Bleeding and coagulation time were within the normal limits. The Kahn test of the blood and agglutination test for brucellosis gave negative reactions. Tuberculin (first strength P.P.D.) produced a marked reaction. Roentgenologic examination of the chest disclosed no pathologic changes. Capillary-resistance test was positive, numerous petechial hemorrhages appearing in three minutes.

Ocular examination. The right eye was normal, with vision of 20/20. Vision in the left eye was 20/70. The anterior chamber and cornea were free from inflammatory reaction. The media were clear. The borders of the optic disc were somewhat irregular, and there was a small patch of choroidal atrophy on its nasal side. The macular area (fig. 13) presented an elevated, dark-greenish, somewhat irregular lesion with indistinct borders about the size of the optic disc. The upper border of the lesion was just below the central portion of the macula. It was surrounded by an area of subretinal edema about three times as large as the lesion itself. One large branch of the inferior temporal artery presented a

local constriction just as it branched off the main vessel. It coursed over the lower border of the main lesion, giving off several branches coursing toward the superior border. Another smaller vessel, a branch of the superior temporal artery, presented more marked local constrictions as it passed above the lesion. There were several hemorrhages in the main lesion and surrounding it. The rest of the fundus appeared normal.

Under large doses of ascorbic acid and multiple vitamins, vision, at first, rapidly improved to 20/50, but by May 12th numerous fine, whitish exudates developed

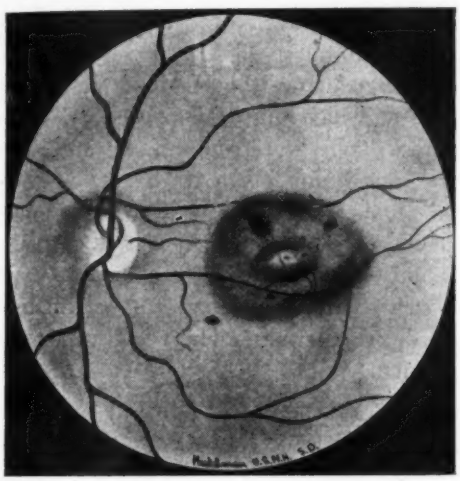

Fig. 13 (Lucic). Case 7. Ophthalmoscopic appearance of the left eye, showing lesion and constriction of vessels; vision 20/70.

which simulated "retinitis circinata," and vision was reduced to 20/200. On May 16th, intravenous injections of sodium nitrite (100 mg. daily) were started, under which vision improved to 20/40, hemorrhages became less numerous, and exudates thinned out. During the next four months vision was reduced to 20/200 in spite of continued treatment with ascorbic acid, nicotinic acid, typhoid vaccine, and sodium nitrite.

CASE 8. D. E. L., an aviation radioman, first class, aged 24 years, entered the Hospital on May 19, 1944, because of a dark mass in the macular region of the left eye which his ophthalmologist

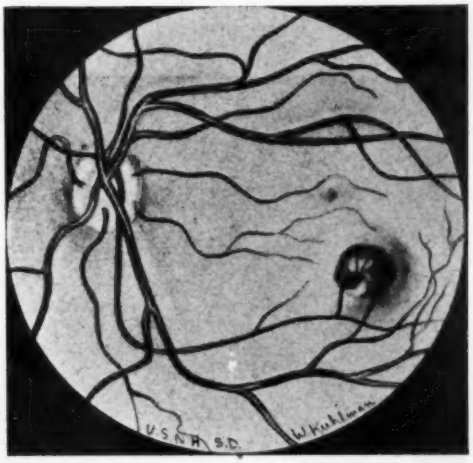

Fig. 14 (Lucic). Case 8. Ophthalmoscopic appearance of the left eye. The dark lesion was mistaken for melanoma; vision 20/70.

thought to be a melanoma. The patient complained of blurred vision in the left eye and a dull pain over the left side of the forehead of about three weeks' duration.

Physical examination revealed a blood pressure of 132 systolic and 92 diastolic. Roentgenograms of the chest disclosed no pathologic changes. No foci of infection were found present in the mouth, throat, sinuses, or prostate gland. The only positive finding was a mild reaction to tuberculoprotein (first strength P.P.D.). The capillary-resistance test was negative. Blood count was within normal limits.

Ocular examination. The right eye was normal, with vision of 20/20. Vision with the left eye was 20/70. The media of the left eye were clear, the blood vessels and the optic disc appeared normal. The area just temporal and inferior to the macula

(fig. 14) presented a dark-brown, disciform, elevated lesion about two-thirds the size of the optic disc, surrounded by an area of subretinal edema slightly larger than the disc. Several blood vessels coursed in front of the lesion. No visible hemorrhages were present. The rest of the fundus and blood vessels appeared normal.

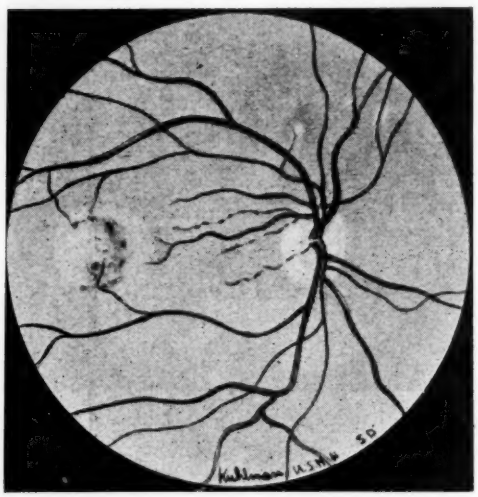

Fig. 15 (Lucic). Case 9. Ophthalmoscopic appearance of the right eye, showing lesion and constriction of vessels; vision 20/70.

On the day of admission the patient was started on daily intravenous injections of sodium nitrite, the first dose consisting of 50 mg. and the subsequent doses of 100 mg. each. On May 27th, vision was 20/20, there was less subretinal edema, but three small hemorrhages had appeared along the superior border of the dark lesion. On June 2d, sodium nitrite was discontinued; there was a superficial hemorrhage along the inferior border of the lesion, but vision was still 20/20. On June 9th, there was no appreciable change in the appearance of the lesion, and vision was 20/20. Daily intramuscular injections of ascorbic acid (100 mg.) were started on this date; a total of 23 injections were given. During the course of these injections vision was reduced to 20/40, and multiple new small hemorrhages appeared along the borders of the lesion. The injections of ascorbic acid were discontinued, and sodium-nitrite injections were again resumed, the dosage now being gradually increased to 150 mg. Again there was gradual improvement in vision, and the hemorrhages gradually disappeared. A total of seven injections was given over a period of 13 days, at the end of which time vision was 20/30, and most of the hemorrhages had become absorbed. During the ensuing three weeks the patient was given orally, 150 mg. of nicotinic acid and 65 mg. of phenobarbital in divided doses. He was discharged from the Hospital on August 23d, at which time vision was 20/15, no hemorrhages were present, and the lesion was approximately a third smaller than on admission. He was last seen on December 7th when vision was 20/15; the lesion was somewhat smaller but there was a small hemorrhage at the temporal border of the mass. The vessels appeared normal.

Case 9. R. L. G., a chief carpenter's mate, aged 31 years, entered the Hospital on July 24, 1944, complaining of diminished vision in the right eye of which he had first become aware seven days previously.

General examination revealed a blood pressure of 120 systolic and 80 diastolic. Special examinations revealed no evident foci of infection in the sinuses, throat, or prostate gland. Roentgenograms of the chest, paranasal sinuses, and teeth disclosed no pathologic changes. The Kahn test of the blood, agglutination test for brucellosis, and urinalysis gave negative results. Tuberculin test (second strength P.P.D.) gave a moderately positive re-

action. The blood count was 4,920,000 red cells and 11,050 white cells, with 47 percent polymorphonuclears and 45 percent lymphocytes.

Ocular examination. Vision with the right eye was 20/70. This eye presented (fig. 15) a grayish, elevated, disciform lesion in the macular area about the size of the optic disc, with vessels coursing in front of it, and surrounded by a circular area of deep edema. Numerous deep and superficial hemorrhages were scattered irregularly about the lesion and some were in front of it. The retinal vessels were normal except for three small macular arterioles which showed irregularities in the lumens. Superior and superior nasally to the disc were two small, flat, grayish areas of healed choroiditis. The anterior segment was normal. Vision in the left eye was 20/20. This eye appeared normal except for a number of small, circular, choroidal scars scattered about the disc nasally and inferiorly and one just above the macula.

During the first week of hospitalization vision spontaneously improved to 20/30, and hemorrhages became less numerous. Treatment was then started, consisting of nicotinic acid by mouth (150 mg. daily) for three weeks and sodium nitrite by vein (100 mg. daily), but without benefit. As a matter of fact, vision was gradually reduced to 20/70, and hemorrhages became more numerous. The patient was last seen on September 26th, when vision was 20/70; there was no material change in the appearance of the lesion except that a few whitish punctate exudates had appeared inferior to the lesion.

CASE 10. M. F. S., a seaman, first class, aged 33 years, entered the Hospital on September 20, 1944, complaining of gradual impairment of vision in the left eye and distortion of objects.

Physical examination disclosed a blood pressure of 138 systolic and 80 diastolic. No apparent foci of infection were present. Roentgenograms of the chest showed no pathologic changes. The white blood count was 6,800 cells with 50 percent segmented neutrophiles, 49 percent lymphocytes, and 1 percent eosinophiles. The Kahn test of the blood and agglutination test for brucellosis gave negative reactions. There was a moderate reaction to tuberculoprotein (second strength P.P.D.).

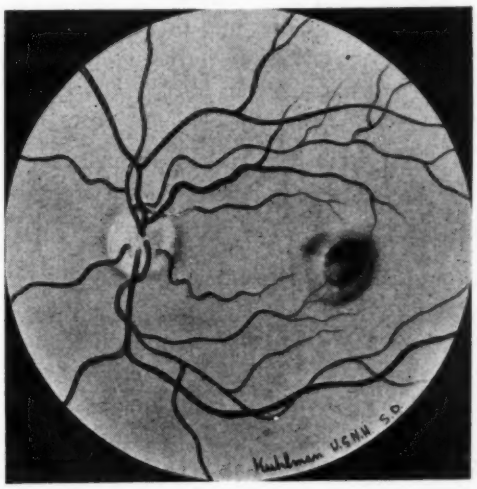

Fig. 16 (Lucic). Case 10. Ophthalmoscopic appearance of the left eye; vision 20/20.

Ocular examination. The right eye was normal with vision of 20/15. Vision with the left eye was 20/20, but the objects appeared elongated and the right borders concave. This eye presented a greenish-gray, elevated, roughly round lesion, about three-fourths the size of the disc, surrounded by an area of subretinal edema and located just temporal and inferior to the macula (fig. 16). Several of the vessels coursed in front of the lesion. Two small vessels, branches of the superior and inferior temporal arteries, showed local constrictions and strong

pulsations. No hemorrhages were present. There was a corresponding paracentral scotoma.

Treatment consisted of intravenous administration of sodium nitrite (100 mg. per day) and nicotinic acid (150 mg. per day) by mouth. At the end of three weeks there was no apparent change in the lesion or vessels and no hemorrhages had appeared. Vision was still distorted but it had improved to 20/15. There was no further change two months after admission.

Comment

The histologic evidence thus far presented, while insufficient to allow far-reaching conclusions to be drawn, suggests nevertheless that senile and juvenile disciform degeneration may be different degrees of the same disease.

The pathologic picture in senile disciform degeneration has been described by Behr,[7] Rintelen,[8] Braun,[9] Verhoeff and Grossman,[3] Sandoz,[10] Brown,[11] and others, and a good summary is given by Duke-Elder.[12] It consists at first, of a large mass of hemorrhage located between the pigment epithelium and lamina vitrea, which apparently originates in the choriocapillaris and extravasates through tears in the lamina vitrea. Later the hemorrhage becomes organized so that the final picture is that of a mass of connective tissue, proliferated pigment cells, and blood vessels. Hyaline degeneration and even bone formation may take place. The retina is usually spared except for secondary degenerative changes. In most cases sclerotic changes in the choroidal blood vessels and occasionally lymphocytic infiltration of the choroid are present.

The picture in juvenile disciform degeneration, as shown by Verhoeff and Grossman and as here presented by me, consists primarily of serum exudate between Bruch's membrane and pigment epithelium which also originates in the choriocapillaris and extravasates through minute tears in the lamina vitrea. The serum may or may not become organized, depending on the severity and the duration of the condition. In Verhoeff and Grossman's case little organization took place, whereas in mine organization was more marked. In Terry's case, on the other hand, there was a more severe reaction than in either of our cases, apparently being identical to the picture of senile degeneration, except for arteriosclerosis. Gifford and Cushman's case is difficult to evaluate owing to associated retinal changes, but it may well represent a stage between Terry's and my case.

While Verhoeff and Grossman's case, owing to the patient's advanced age, may not represent, in the accepted sense, the true picture of juvenile disciform degenertion, it nevertheless proves that a lesion almost identical to the juvenile type does occur in old age, in the absence of arteriosclerosis. Thus we have, both in advanced age and in youth, an almost identical histologic picture which varies between the two extremes; namely, a mild lesion consisting mainly of serum exudate on the one hand, and an advanced lesion with hemorrhage and connective-tissue organization on the other. The chief difference appears to be that of arteriosclerosis, which is usually present in senile and absent in juvenile degeneration, but which is also the usual finding expected in old age and youth. It seems therefore reasonable to assume that both the senile and juvenile disciform degenerations are one and the same disease, dependent upon similar etiologic factors, whose degree of severity is influenced by preëxisting vascular sclerosis.

What etiologic factors play a part in the causation of this serum exudation is a matter of speculative interest. Duggan[13] believes that disciform degeneration and

choroidosis centralis serosa or central angiospastic retinopathy are all lesions due to increased capillary permeability and that all substances are possible etiologic agents which by virtue of their presence (histamine, and other agents) or their absence (acetylcholine, cevitamic acid) can cause either arteriolar spasm or increased capillary permeability or both. Be this as it may, the clinical evidence of associated vascular disease of the retinal vessels in some of the cases here presented suggests that the exudation may be the result of some local neurovascular disturbance. The histologic evidence here presented, however, leaves little doubt that the primary seat of the reaction is in the choroid and not in the retina.

The common belief that complete recovery may be expected in every case of juvenile disciform degeneration, within a few months, is not supported by this group of cases. I believe that the final outcome depends greatly on the severity and the duration of the condition. If little or no organization of the serum takes place, recovery may be expected within a reasonable period of time. However, if organization is marked, as demonstrated histologically in one of the cases, complete recovery may never take place.

Summary and Conclusions

The clinical and ophthalmoscopic observations in 10 cases and the microscopic findings in one case of juvenile disciform degeneration of the macula are described.

The patients were white men between the ages of 19 and 37 years, and in the active service of the Navy. In four of the men the right eye was affected, in five the left eye, and in one, both eyes.

The lesions varied in size from one-half to 3 disc diameters, and in color from dark-brown to gray. They were usually surrounded by hemorrhages and deep edema, and in three of the cases by whitish exudates. In some of the patients local constrictions of the retinal vessels were present. Vision varied from 20/20 to 4/200.

The microcopic examination revealed a mass of organized tissue between the lamina vitrea and pigment epithelium, not unlike that seen in senile disciform degeneration. Serum exudate surrounded the mass of tissue. The lamina vitrea was ruptured, the choroid was somewhat thickened and infiltrated with lymphocytes.

It appeared that the serum had originated in the vascular bed of the choroid and had undergone organization.

It is suggested that both the senile and juvenile forms of disciform degeneration are merely different degrees of the same disease, dependent upon some neurovascular disturbance.

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TOTAL RECONSTRUCTION OF THE UPPER LID (BLEPHAROPOIESIS)

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When the upper lid is torn off or must be removed on account of malignancy, the main protection of the eye is gone, since it normally covers and protects approximately three quarters of the cornea when in the primary position. The cornea cannot long remain clear and function normally if its protecting cover is missing.

Structurally, functionally, and surgically the lids may be divided into two layers: the inner one, comprising the conjunctiva and tarsal plate with its attached levator muscle, and the outer layer, comprised of the skin, lashes and all structures superficial to the tarsus. The reconstruction of each of these layers must be planned to provide a proper lid which will function well and have a good cosmetic appearance.

The upper lid is much more difficult to reconstruct totally than is the lower lid. Fortunately, the indications are much less frequent, since malignancy is 10 times more frequent in the lower lid. The upper lid is more protected by the brow and orbital margin from traumatism than is the lower; it is also more flexible and elastic, a characteristic which permits greater injury with less damage than is the case with the lower lid.

GENERAL DISCUSSION OF UPPER-LID RECONSTRUCTION

The inner layer of a new upper lid should be such that it provides a smooth mucous epithelial lining which comes down over the cornea to spread the secretions over it. For this purpose no substitute acts so efficiently as normal conjunctiva. When normal conjunctiva cannot be found, other mucous membrane may be used to line the lid. Skin should never be used to line the lid where it will come in contact with the cornea, for the cornea may be damaged owing to the rough debris from desquamation. Normally, the mucus secreted by conjunctival glands is mixed with secretions from the lacrimal, and meibomian glands, a small amount of sebaceous secretion, and perspiration from the glands along the lid margin in order to produce a lubricating fluid that protects the cornea and conjunctiva and allows the lids to slide freely, without friction or irritation. The aim should be to duplicate as nearly as pos-

sible in the new lid the tissues that produce this ideal fluid. A certain amount of it disappears by evaporation and the remainder is drained off through the lacrimal passages. When the upper lid is absent the conjunctiva becomes inflamed, thickened, and rough, and loses its luster from lack of protection and consequent excessive evaporation. The vitality of the corneal epithelium is endangered and ulcerations form when it remains thus exposed.

The upper lid must not only cover the cornea and bulbar conjunctiva but must be movable so that it can sweep up and down on the cornea and conjunctiva and thus constantly renew the fluid film over the eye. Its power of elevation must be sufficient to prevent the lid from obstructing the pupillary area to allow for vision and to be cosmetically pleasing. The lower border of the upper lid should arch evenly, traversing the cornea at about the junction of the middle and upper thirds. The function of the levator for elevation of the lid is important. The function of the fibers of the orbicularis, particularly the portion near the lid margin, is of little importance. When the normal tonicity of the levator is inhibited, as in attempting to close the lids or in sleep, the upper lid will fall of its own weight unless it is held up by scar tissue or is too short vertically.

The conjunctiva of the upper lid should be backed by a firm plate to give rigidity and shape to the lower part of the lid, as a substitute for the tarsus. This plate should be thin and shaped to fit the eyeball, and to it the levator should be attached. For this purpose there is nothing superior to tarsus itself, with its covering layer of conjunctiva. A piece of tarsus of sufficient dimensions can usually be obtained from the opposite upper lid, where considerable additional conjunctiva is frequently available to form the upper fornix. When tarsus is not available a piece of ear cartilage may be utilized onto which may be pregrafted a layer of mucous membrane. For this latter purpose buccal mucous membrane should be implanted into a prepared pocket directly onto the concave surface of a portion of the cartilage of the ear that will provide a piece of proper curvature and of ample size. The mucous membrane is inserted into a prepared pocket, with its raw surface against a suitable concave portion of the ear cartilage and allowed to grow in direct contact with the cartilage. If it is placed on a flat semicircular form before being slipped into the pocket it will heal with a minimum of shrinkage. Three weeks later, when the mucous membrane has grown to the underlying cartilage, the double layer representing tarso-conjunctiva is transplanted to the proper location on the inside of the upper lid as a free graft. The mucous-membrane-lined cartilage thus provides a smooth lining to allow the new lid to fit snugly and to move freely and without irritation over the exposed surface of the eye. Its margins are attached to the conjunctival edge above and below in the same manner as is used when the tarsus (with its closely adherent conjunctival layer) is used.

To protect the inner layer of the upper lid and to allow it to function properly the outer layer must be well planned. The most important consideration for this outer layer is the provision of a thin, flexible, cutaneous layer of sufficient dimensions to provide a fold and to allow the lid to fall sufficiently to meet the lower lid and thus completely cover the eye even during sleep. The cutaneous layer should match the lid skin of the opposite upper lid in dimensions, flexibility, texture, color, and thinness as well as in its architecture.

The lashes on the margin of the upper

lid are functionally and cosmetically important and can usually be quite well provided by utilizing a properly chosen strip of hair-bearing skin from the nasal end of the brow on the same side.

If the nasal and/or temporal canthal angle is undamaged or can be preserved (as in the case reported later, figure 1) its integrity should be carefully guarded, since the presence of normal angles is an important factor cosmetically. Once they are destroyed it is difficult to duplicate them exactly.

When the lower lid is absent or deformed as well, the reconstruction of a suitable upper lid becomes much more complicated. When both upper and lower lids are entirely absent, the problems are multiplied because of the absence of any nearby lid structure and the larger area to be reconstructed.

One may readily see from what has been pointed out that the reconstruction of a good upper lid is a difficult surgical problem. For an ideal upper lid one should strive to produce a lid which, when completed, will exactly match the normal, but practically one must be contented with somewhat less than a theoretically perfect result.

The new upper lid must provide as a minimum:

1. Protection from exposure for the bulbar conjunctiva and cornea.

2. Size sufficient to allow for closure in order to protect at least the cornea during sleep, and motility sufficient to spread the conjunctival fluid over the eye by winking and by elevation to uncover at least part of the pupillary area.

3. Externally at least a fairly acceptable match for the opposit upper lid in respect to color, texture, flexibility, dimensions including thickness (or rather thinness) and vertical length, arching, and so forth.

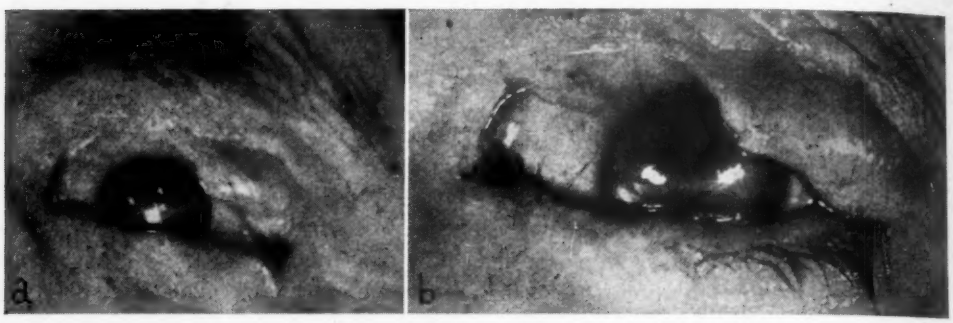

Fig. 1 (Hughes). a, the upper lid of the left eye had been torn off in an automobile accident. A tiny nubbin of upper lid temporally remained so that the canthal angle was preserved. b, enlarged view showing skin of the brow directly continuous with the conjunctiva, with no semblance of any fornix except at the temporal end.

Case report

Reconstruction of the entire upper lid in the presence of a normal lower lid.

A woman, aged 56 years, had had her left upper lid cut off by flying glass in an automobile accident two years prior to her first visit. The only remaining portion of the upper lid was a tiny nubbin of tissue including four or five lashes at the temporal canthus. The skin just below the brow was directly continuous with the conjunctiva about 2 mm. above the upper limbus, with no semblance of a fornix except for a small area near the temporal canthus where the portion of the lid tissue remained (fig. 1).

The cornea was cloudy from ulceration

and scarring as the result of long exposure.

The lower lid was uninjured.

The other eye was normal. There was a moderate amount of scarring in the nearby areas, partly from the original accident and partly as a result of pedicled flap grafts which had been used in the course of seven operations in attempts to build an upper lid.

The following steps were taken in the surgical procedure: 1. Provide a protection for the eye (blepharorrhaphy). 2. Free graft of skin for the lid to provide the outer layer. 3. Free transplantation of tarsus for the inner layer. 4. Reattachment of the levator for motility. 5. Transplantation of lashes. 6. Incision to make the interpalpebral fissure.

Stage 1. Blepharorrhaphy

One of the prime considerations in this case was the preservation of the eye—for this a covering was necessary. The skin of the brow was separated from its attached conjunctiva (fig. 2) above the upper limbus by an incision with a cataract knife, and the skin above undermined for the removal of the scar tissue present. The conjunctiva was ballooned up nasally (fig. 3) and a flap dissected up nasally (fig. 4) and brought across temporally above the limbus (fig. 5); another similar flap was dissected temporally and brought across the eyeball above the nasal flap to provide sufficient bulbar conjunctiva above (fig. 6). The lower lid was then split into two layers (fig. 7) by means of an incision along its border, starting close to the conjunctival edge of the lid margin and then following the line of cleavage provided by the superficial surface of the tarsus down to the lower fornix. This inner layer was incised perpendicular to its margin nasally, just tem-

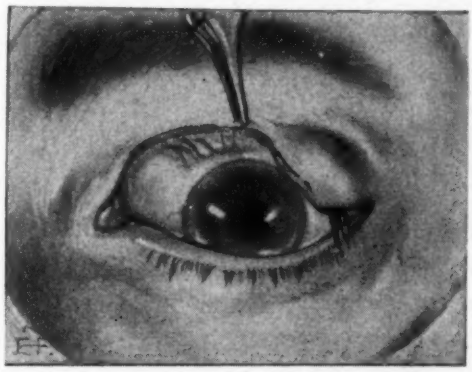

Fig. 2 (Hughes). Line of incision at the junction of the conjunctiva with the skin.

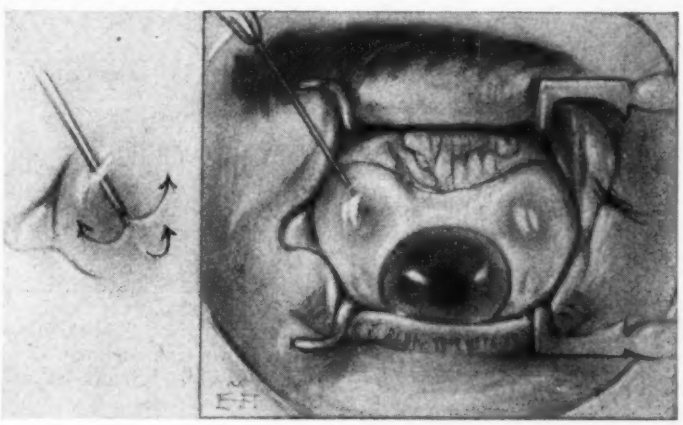

Fig. 3 (Hughes). Subconjunctival injection of fluid to aid in dissecting thin conjunctival flaps. The bevelled edge of the needle is kept forward and the fluid injected superficially.

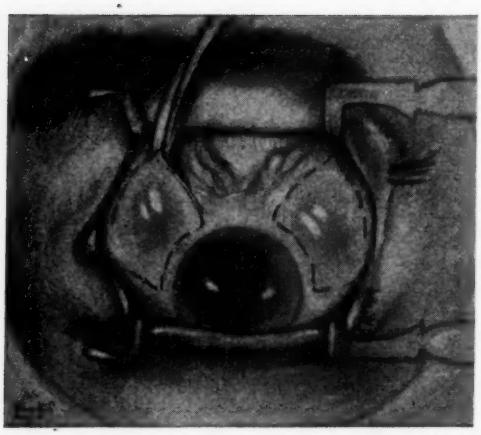

Fig. 4 (Hughes). Outline of conjunctival flaps nasally and temporally.

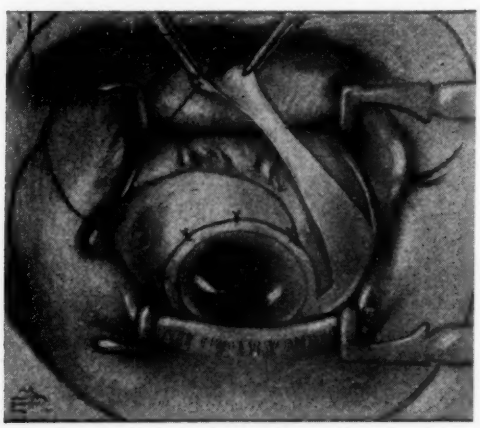

Fig. 5 (Hughes). Nasal flap anchored in position. Temporal flap freed.

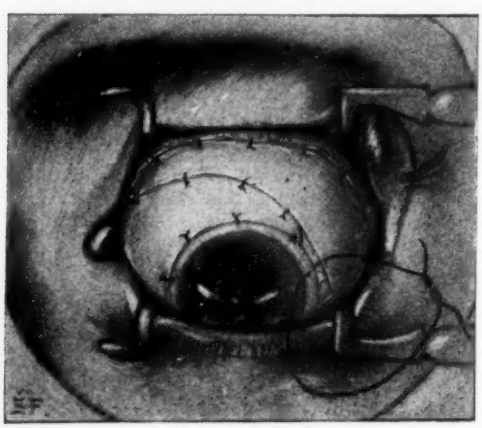

Fig. 6 (Hughes). Temporal flap sewn in position to provide bulbar conjunctiva above.

poral to the punctum and temporally opposite the free end of the nubbin of upper-lid tissue remaining at the lateral canthus. The inner layer thus being freed (fig. 8) except for its conjunctival attachment below was brought up and sewn to the upper part of the eyeball by means of a continuous suture, brought out at each end and locked.*

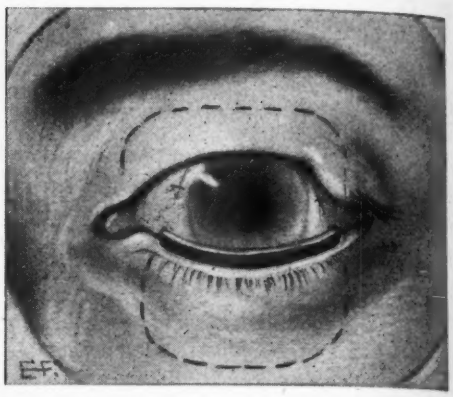

Fig. 7 (Hughes). Lower lid split into its two layers.

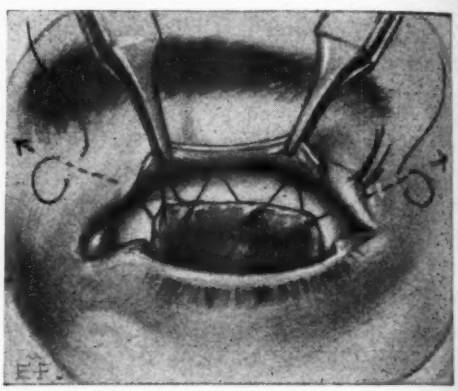

Fig. 8 (Hughes). The tarso-conjunctival layer of the lower lid was united by a continuous black-silk suture brought out and locked externally at each end.

* It is important when using this type of suture to see that the ends are firmly locked and that each loop of the suture is pulled up snugly to approximate accurately the edges of the tissue and keep them in apposition. Failure to keep the edges in accurate approximation may lead to total failure of this procedure.

The smooth conjunctival lining to protect the cornea was now provided and it was, of course, necessary to cover this by an epidermal layer. This latter was done by uniting the lash border of the lower lid to the cut edge of the skin which had been freed and undermined above (fig. 9) by means of a subcuticular stitch. To allow the lower lid to stretch up so far it was necessary to undermine it well below. The final arrangement was then as seen in cross section in figure 10.

A double layer of perforated cilkloid to which was applied a thin layer of 5-percent sodium-sulfathiazole ointment was placed over the area and a pressure dressing applied. This was left in place for five days and then reapplied. It was changed every four days for a period of three weeks. Firm pressure was continued with tightly packed fluffed gauze held in place with adhesive and a head bandage for the first two weeks; for the third week with adhesive only. If the adhesive is warmed slightly at the ends by placing the back of the ends against a warm electric light bulb it will adhere more firmly to the skin.

Stage 2. Free graft of full-thickness lid skin from the opposite upper lid

Seven weeks after the first stage the tissues had become supple and there was then a complete protecting layer lined by conjunctiva covering the eye. There was only a small amount of skin between the row of lower-lid lashes and the brow so it was necessary to provide extra skin for the ultimate upper lid. A transverse incision parallel to the lashes and about 2 mm. above it (fig. 11) was made through the skin and carried down almost to the conjunctiva.

Scar tissue was excised from the area above to allow the lower-lid margin to be pulled down. A tension suture was placed at the lower part to keep the area

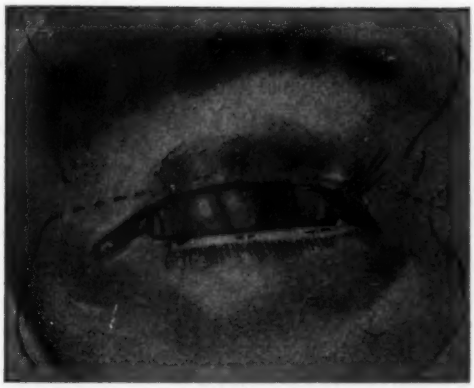

Fig. 9 (Hughes). Subcuticular suture to unite the cutaneous layers.

which was to provide the bed for the graft stretched out well (fig. 12). An area of skin corresponding in size to the exposed area was then removed in its full thick-

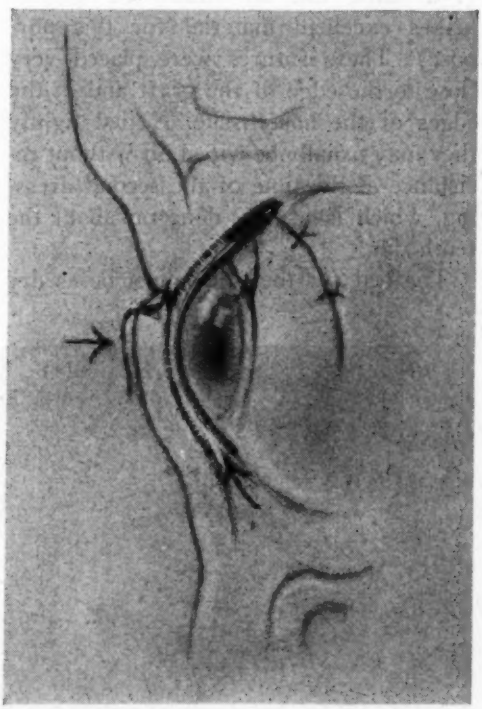

Fig. 10 (Hughes). Cross section of lids showing tarso-conjunctival layer of the lower lid brought up to the upper fornix and the outer layer of the lower lid united to the skin just below the brow. The arrow indicates direction of pressure from pressure dressing.

Fig. 11 (Hughes). Second stage. Incision through cutaneous layer.

ness from the opposite upper lid and sewn (figs. 13a and 13b) in position over the area using numerous, small, fine sutures (7-0 black silk on atraumatic needles makes excellent material for this purpose). These sutures were placed very close to the edge of the graft and in the edges of the host tissue. If tied tightly they may usually be wiped off without resistance at the time of the second dressing, which is usually done on about the tenth day.

The bed for the graft must be as dry as possible and free of large clots or foreign substances. It is better to use coagulating diathermy current when possible for sealing off blood vessels than to tie with sutures in order to avoid foreign material in the bed of the graft. If the electro-coagulation is minimal it will not interfere with the taking of the graft. Better still is a small amount of fibrin foam soaked with thrombin applied to the bleeding points. If only a very small

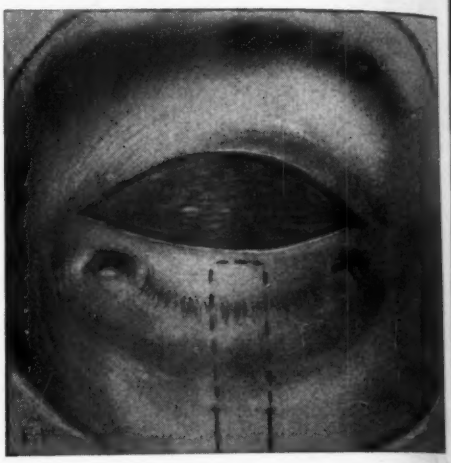

Fig. 12 (Hughes). Bed ready to receive full-thickness lid-skin graft from the opposite upper lid.

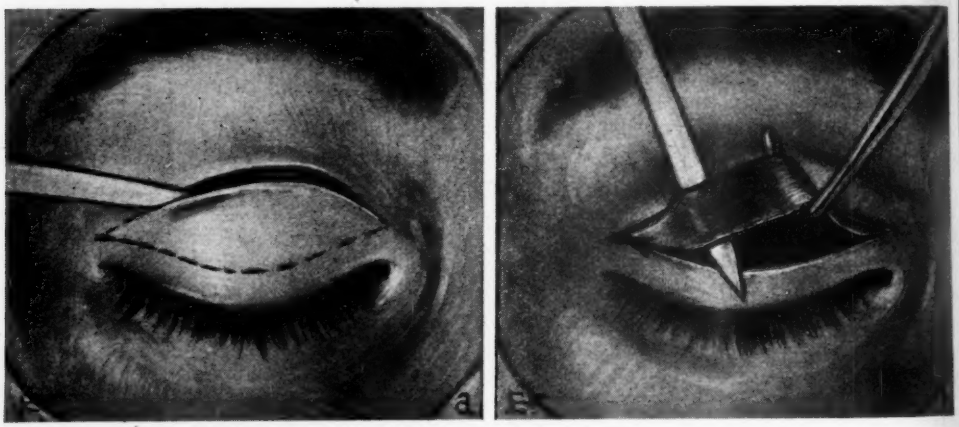

Fig. 13 (Hughes). a, opposite upper lid ballooned up by a very superficial injection of procain hydrochloride and the outlining incision made completely through the skin. b, the graft removed with as little subcutaneous tissue as possible.

amount is used it will not interfere with the viability of the graft.

The double-arm tension suture placed in the middle of the lid margin was pulled snug to put the graft on the stretch and tied externally (fig. 14). A double layer of perforated cilkloid* with a thin layer of sodium sulfathiazole ointment on its surface was placed over the entire area and fluffed gauze firmly packed over it. This was held in place with a pressure dressing to insure immobility of the tissues and minimal swelling during healing. The dressing was changed in five days and thereafter every four or five days, continuing the pressure for two weeks,

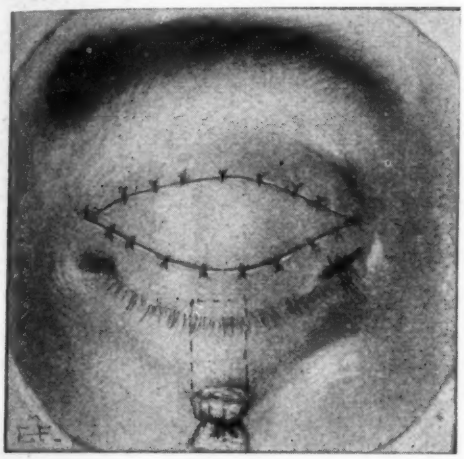

Fig. 14 (Hughes). Graft sewn in position with very fine, closely applied tiny silk sutures.

after which the dressing was somewhat less tight for another week.

Stage 3. Transplantation of tarsus from the opposite upper lid

Seven weeks later a transverse cutaneous incision was made at the upper border

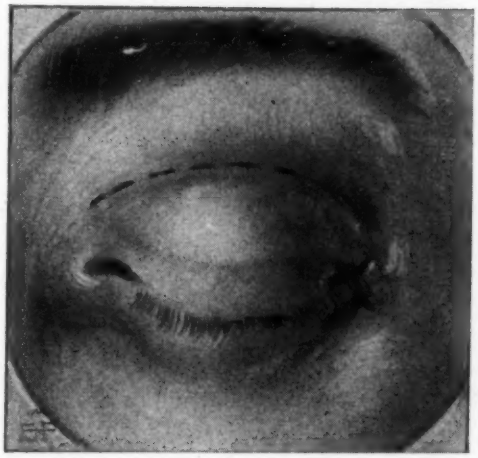

Fig. 15 (Hughes). Third stage. The line of the superficial incision down to the conjunctival layer is shown. The outline of the skin graft was barely visible.

of the free graft (fig. 15) and the dissection carried down subcutaneously to the lower border of the upper lid, just parallel to the row of lashes of the lower lid. The incision was then carried through the inner conjunctival layer from side to side. (fig. 16). The conjunctival edges

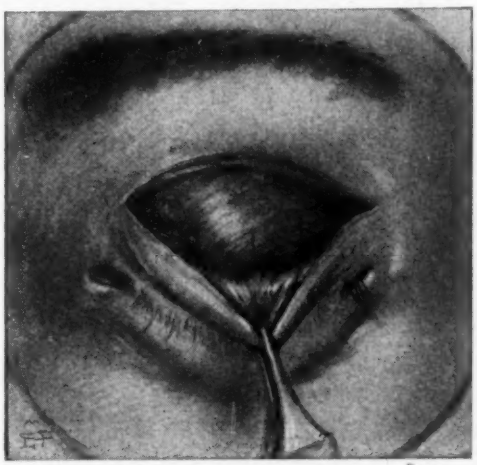

Fig. 16 (Hughes). The cutaneous layer has been undermined and retracted downward. The incision through the conjunctival layer was made transversely at the lower portion of the exposed area just above and parallel to the row of lashes of the lower lid.

* If the cilkloid is soaked for a few seconds in ethyl alcohol (not 70 percent) it becomes quite pliable. If left too long in the alcohol it completely dissolves. As soon as it becomes sufficiently pliable the excess may be washed off with boric acid.

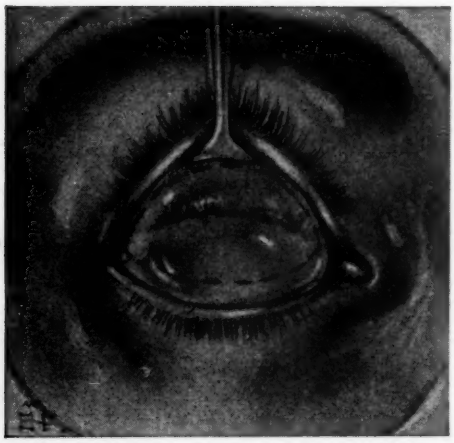

Fig. 17 (Hughes). The conjunctiva of the opposite upper fornix was ballooned up to facilitate the removal of the tarsus with the adjoining conjunctiva above.

were separated sufficiently to receive a free tarso-conjunctival graft from the opposite upper lid.

The opposite upper lid was then everted, and a transverse incision made through the tarsus parallel to, and 1½ mm. from, the lid margin. The conjunctiva of the upper fornix was ballooned up with procain hydrochloride, and a considerable amount of conjunctiva was left attached to the tarsus when it was dissected free in order to provide sufficient conjunctiva when inserted to form the fornix above (figs. 17 and 18). The upper margin of conjunctiva of the fornix was secured by means of a continuous silk suture brought out and locked at each end. Two double-armed sutures were passed through the conjunctiva just above the upper border of the transplanted tarsus and brought out through the upper lid (fig. 18) ready to be tied over pegs which, when pulled tight, held the conjunctiva up to retain the fornix. The lower border of the tarsus was then attached to the lower margin of the original conjunctival incision by means of another continuous suture brought out and locked at each end (fig. 19). The skin incision was closed by continuous (or interrupted) fine, black-silk sutures which picked up the deeper tissue each time to hold it firmly down along the line which would later be the fold in the

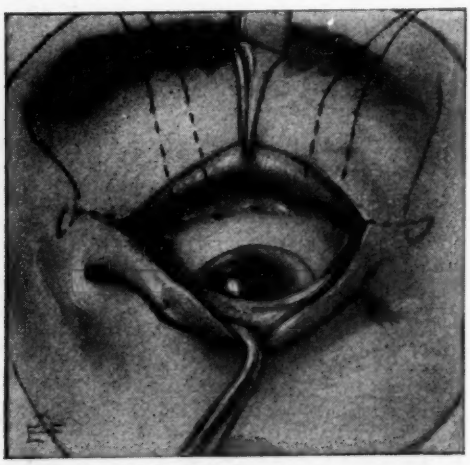

Fig. 18 (Hughes). The tarsal edge of the free tarso-conjunctival graft is held up to show (1) the conjunctiva united above by means of a continuous suture brought out externally and locked at each end, and (2) the double-armed sutures placed to retain the fornix during healing.

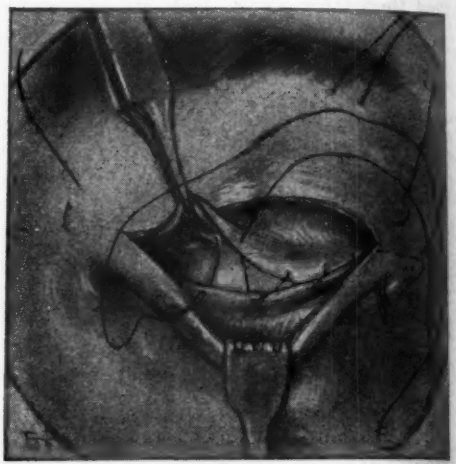

Fig. 19 (Hughes). The lower tarsal margin is being united to the palpebral conjunctiva below by means of a continuous suture locked externally at each end.

upper lid. The fornix-retaining sutures were tied over pegs (fig. 20).

A similar pressure dressing was applied to the area and kept on for a similar period of time.

STAGE 4. REATTACHMENT OF THE LEVATOR

Eight weeks later under local anesthesia an incision was made along the line of the fold in the upper lid down to the eyeball above the upper fornix. During the dissection the position of the fornix was identified by passing a muscle hook under the lid and pushing it upward, to avoid injury to the newly transplanted tarsus and prevent button-holing

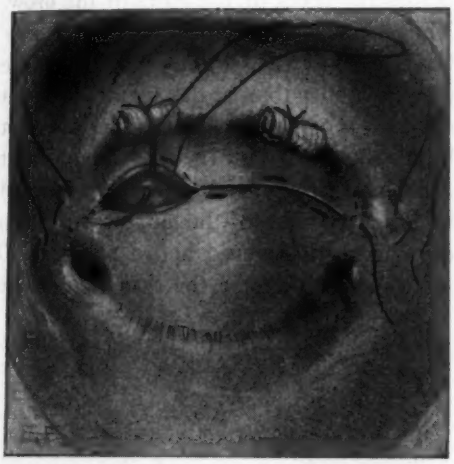

Fig. 20 (Hughes). Closure of the incision picking up the fascia to anchor it firmly for the purpose of forming the fold in the lid.

the conjunctival layer. Subcutaneous scar tissue was removed along the upper orbital margin. Keeping close to the orbital roof, a layer of tissue was dissected free which was in a location usually occupied by the levator. By freeing this layer up and inducing the patient to open the other eye widely the action of the levator on the tissue could be easily identified. When the layer of tissue to which the aponeurosis of the levator tendon was attached was completely freed it retracted into the space between the upper orbital margin and the superior rectus muscle.

The latter muscle is frequently uncovered during this type of dissection for

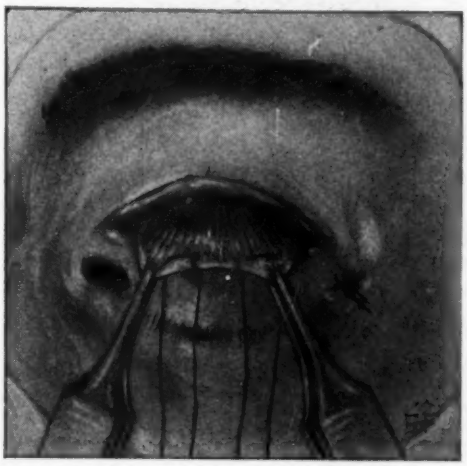

Fig. 21 (Hughes). Fourth stage. The aponeurosis of the levator of the upper lid has been separated and two double-armed sutures placed through it which will anchor it to the underlying tarsus.

the removal of scar tissue. One must be careful in injecting the procain-hydrochloride solution not to put it deeply into the orbit or into the region of the active muscle fibers of the levator in order to prevent a paralysis of the muscle, since it is particularly by the activity of this muscle that the severed aponeurosis of the levator may be accurately identified and sewn back into position onto the anterior surface of the upper tarsus.

Two double-armed sutures were passed through the aponeurosis from without (fig. 21), brought down to pick up a superficial bite of tarsus tissue, and then brought out through the skin of the upper lid near its margin and tied over separate rubber pegs. These sutures should be tied firmly, but not tightly enough to produce local necrosis from pressure. The skin

incision was then closed in the manner described under stage 3 (fig. 22), and a similar dressing applied.

Pressure was maintained for about 10 days and a light dressing thereafter. In

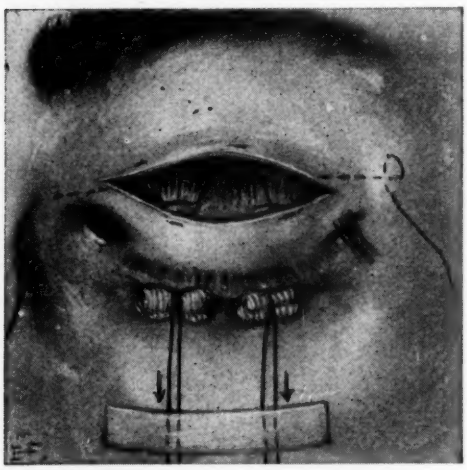

Fig. 22 (Hughes). The aponeurosis of the levator has been brought down and anchored to the anterior tarsal surface. The skin closure as after stage 3.

applying the dressing care was taken that the skin just below the line of the incision in the upper lid was held firmly in place. This was done by placing a moderately tight roll of gauze about the size of a pencil transversely along the line of the incision to make the skin tightly adherent over the tarsus to form and maintain the fold in the upper lid. The action of the levator on the upper lid was easily demonstrated by asking the patient to open the opposite eye widely.

Stage 5. Lash transplant

A trough of a length corresponding to the lashes of the opposite upper lid was formed to receive a graft from the brow. A hair-bearing strip of skin was then dissected from the nasal end of the brow on the same side in such a location as to provide hairs of the best direction. Usually the hairs that provide the best lashes are those at the nasal end of the brow near its lower margin. Here the hairs are usually not so heavy nor so long as elsewhere in the brow and they emerge from the skin in a direction more nearly at right angles to the long axis of the brow. A hair-bearing strip of skin was outlined 2.5 mm. wide and of sufficient length to provide a row of hairs comparable in length to the row of lashes of the normal lid of the opposite eye. In measuring this, one must take into account the convexity of the margin of the lid when in its normal relation to the underlying eye.

In making the incision in the brow the skin incision was made so as not to cut across the roots of the hairs of the brow. The incision was, therefore, made obliquely and was slightly wider in the deeper tissues than at the surface. It went deeply enough to escape injuring the root bulbs of the hairs. In order to prevent accidental dropping of the graft, one end and the two sides of the hair-bearing strip of skin were severed and a suture (7-0 silk) passed through the skin edge at the

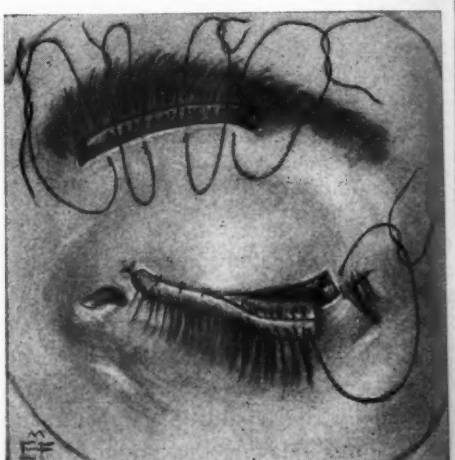

Fig. 23 (Hughes). Fifth stage. Lash transplant, a hair-bearing strip of skin from the brow of the same side is accurately sewn in position with fine black-silk sutures.

free end, only a tiny bite of skin being taken. This suture was passed through the skin at the end of the graft bed, the original nasal end of the strip being kept nasal in its new position to maintain the direction of the hairs in the graft upward, away from the lid margin and slightly temporally. The graft was then completely severed from its original position and the end suture already placed was pulled tightly and tied. The other end suture was then placed and the middle sutures on the upper and lower margin of the graft were next in order. Other fine sutures, placed closed to the margin of the skin of the host area and of the graft, were inserted and tied (fig. 23). In handling the graft, care was taken not to traumatize any more cells than was necessary. The graft was handled by means of the suture and by picking it up by the lashes themselves. When it was necessary to pick up the skin edge for the purpose of placing sutures only the finest forceps and the smallest bites were taken.

Stage 6. Incision of the blepharorrhaphy to produce a lid fissure

As soon as it was seen that the lashes were growing well, and the skin and tissues of the lid were as supple and free of scar tissue as possible, and there was sufficient skin to allow for closure when the lids were opened, a transverse incision was made between the two rows of lashes. The skin was incised down to the tarsus with a cataract knife (fig. 24), and the tarsal incision then made with a scissors.

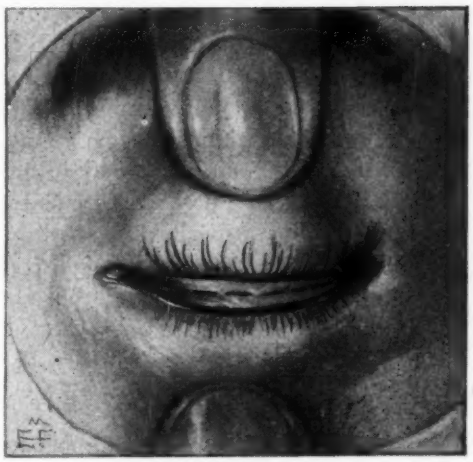

Fig. 24 (Hughes). Sixth stage. Incision for interpalpebral fissure between the two rows of lashes. The superficial layer has been incised with a cataract knife. The inner layer is more easily incised with scissors.

When the lateral canthus has been included in the original blepharorrhaphy the length of the incision should be slightly longer than the normal fissure of the opposite side in order to allow for some adhesion, which usually takes place temporally. To minimize this growing together of the newly opened fissure, few sutures are necessary, one in the angle itself and one or two near the temporal canthus in the upper and the lower lid margin to approximate the conjunctiva

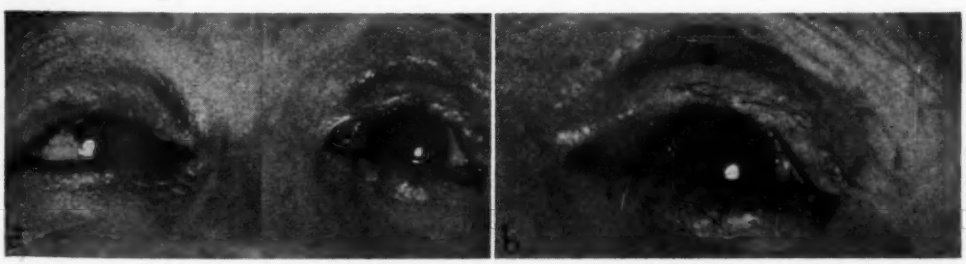

Fig. 25 (Hughes). Final condition of the lids. a, both eyes; b, left eye showing detail.

and the skin so the raw surfaces will not adhere.

Usually no sutures are necessary along the remainder of the lid margins. A light dressing is applied which is changed daily. Frequently the lid margins adhere on the first dressing or two, and must be pulled apart. After four or five days no dressing is necessary. There is usually a moderate amount of discharge present on the dressings.

The final result is shown in figure 25.*

Discussion

This method of rebuilding an upper lid accounts for all of the important features discussed earlier in this paper.

The tarso-conjunctival layer is provided by means of a free graft of tarso-conjunctiva from the opposite upper lid. The lid skin is provided by a full-thickness graft from the skin of the opposite upper lid, supplying skin which matches normal lid skin in every way (area, texture, color, thickness, and flexibility).

Lashes are provided which in the upper lid are important cosmetically and functionally. Motility is provided for in the normal manner by using the levator tendon. No visible facial scars are produced and the safety of the eye is at all times guarded by keeping the cornea in contact with its normal protection; that is, the conjunctiva of the inner surface of the lid.

This method is applicable only in cases wherein there is a relatively normal opposing lower lid and a normal opposite upper lid. The indications for it are, therefore, not common, but when it is indicated it provides a method by which a satisfactory upper lid may be produced.

The patient is not able to close her lids completely, but during sleep the cornea is protected by the new upper lid. The eye is white and the cornea is now free of irritation and ulceration. There are some corneal scars as the result of the severe exposure keratitis she presented when first seen. A year has now elapsed since the lids were opened.

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* A moving picture depicting the various steps in this procedure is available on application to the author.

CATMIN LENSES*

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Catmin lenses are image-minifying lenses which act on the principle of a reversed telescopic lens. The lens minifies images about 23 percent. They are made in an all-glass and also in plastic type. The catmin lens is of special value in some cases of unilateral aphakia as an aid to binocular vision, which is illustrated by the case reports in this paper. The disadvantages are (1) appearance, which is similar to a high myopic lens, and (2) the restriction in the visual field, which is reduced about 23 percent.

Patients are seen with well-developed cataracts in one eye and a normal lens in the opposite eye. This may be due to undetermined natural causes or to trauma. In either event, the patients present themselves for restoration of vision in the affected eye. Removal of the affected lens does not fully correct the visual defect because of the differences in refraction and in image size in the two eyes. While the two images seen by the patient do not represent diplopia as seen in paralytic muscular disease, the patient complains of double vision. The defect could be remedied by the use of contact lenses. However, in some cases contact lenses cannot be used and catmin lenses may be of some value to the patient and therefore have been used to provide binocular vision in patients with unilateral aphakia. In many cases a secondary divergence has occurred following the unilateral loss of vision.

Ten cases have been selected from the files of the late Dr. Sanford R. Gifford to illustrate the use of the catmin lens. These cases are of patients having unilateral developmental cataracts who elected cataract extraction and whose vision subsequently was corrected with catmin lenses in order that they might obtain binocular vision. In a number of the cases lens extraction was performed following trauma and subsequently the patients were fitted with catmin lenses that they might obtain binocular vision.

The traumatic cases were in young children from 5 to 16 years of age, and one is a case in a person, 40 years of age, who had lens opacities in only one eye.

The fitting of catmin lenses is not difficult. The procedure followed after lens extraction is to refract the patient in the ordinary way with trial-case lenses. When the refraction stops changing, the prescription, as determined by the trial-case findings, is written for the catmin lens, the distances between the posterior surface of the lens and the eye are noted, and the catmin lens is ordered. The patient wears the catmin lens and returns for examination by the Maddox rod and loose prisms. The amount of prism necessary to superimpose the images for near and distance is noted, and the visual acuity with the patient using the catmin lens is checked to determine whether the addition of more plus or minus power improves the vision. The lens is then returned to the optician for regrinding to add the plus or minus value to the lens. If fusion is not obtained, as is very often the case, the surgeon then can incorporate the amount of prism necessary to superimpose the images in the distance correction of the nonaphakic eye. If the amount of prism necessary is exceedingly large, surgery on the lateral muscles is suggested in order to improve the cosmetic end result.

*From the Department of Ophthalmology, Northwestern University Medical School.

This surgery is usually performed on the aphakic eye, although the choice of eye makes no difference. After this surgery has been accomplished the amount of prism necessary to superimpose the images is incorporated in the trial-case

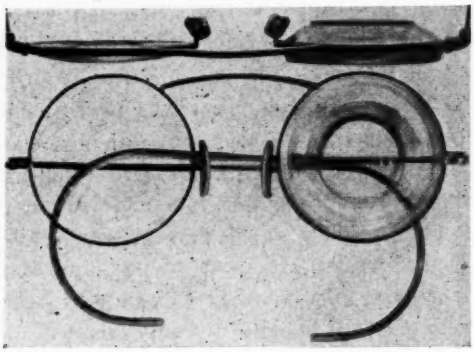

Fig. 1 (Kamellin). Right lens with prism incorporated. Left lens a catmin lens.

findings of the nonaphakic eye. This prism can be changed as the need may arise.

Up to this point the procedures necessary for the correction of distance vision have been discussed; however, if there is difficulty at near, as there usually is because of the loss of accommodation in the aphakic eye, then the addition for near is prescribed as a slipover after the amount necessary has been determined with the catmin lens in place. Iseikonic lenses have been considered in cases of unilateral aphakia; however, they cannot be used to equalize the image sizes because of the great percentage of difference between the size of the aphakic image as compared with the nonaphakic image.

Case reports

Case 1. B. R., aged 23 years, first noticed loss of vision in the right eye three years prior to the initial examination. Examination revealed visual acuity with the R.E. to be light perception and projection; with the L.E. 20/25−1. There was a mature cataract in the right eye, with small precipitates on the cornea and tufts of pigment on the pupillary border of the iris. The right eye diverged 45 prism diopters. There were coronary opacities in the periphery of the lens of the left eye. Tuberculin tests, general check-up, and blood tests gave negative results.

The lens cortex was removed by capsulotomy and corneal expression on August 12, 1940. The patient had a residual fine secondary membrane in the pupillary area after the operation, but the refraction with trial-case lenses with a +12.50D. sph. ⌯ +1.50D. cyl. ax. 105° resulted in 20/25 vision.

Because of the divergence, a recession, resection, and advancement were performed on December 28, 1940. After the operation, the patient had some residual divergence and the catmin lens was ordered for the right eye. The diplopia was corrected by a 4 prism-diopter, base-in lens, which was prescribed for the left lens. With the catmin in the frame, the patient read 20/40+1 and with the addition of a −0.37D. sph. from the trial frame the vision was 20/30−2. This correction was incorporated in the catmin lens. The final examination gave the following results: Vision with glasses, R.E. 20/30; L.E. 20/25. Maddox rod, with correction 3 prism diopters, base in, for far, and 10 prism diopters, base in, for near.

Case 2. Mrs. H. C. P., aged 55 years, was first seen in December, 1942, because of loss of vision in the left eye. Vision with glasses was R.E. 20/15; L.E. 10/100; refraction improved her vision to R.E. 20/15; L.E. 20/65. There were diffuse posterior cortical lens opacities sufficient to account for the loss of vision. The nerve and macula were normal, and therefore no surgery was advised. Three and one-half months later, the patient returned

with the complaint that her left eye was worse. Vision with correction was R.E. 20/15; L.E. 20/200. Slitlamp examination revealed dense posterior cortical lens opacities sufficient to account for the loss of vision. Lens extraction was advised and was performed on January 27, 1943, on the left eye. The final trial-case findings were L.E. +8.00D. sph. ⊂> +3.25D. cyl. ax. 167° for vision of 20/25−1. She could read J1 with the L.E. with a +10.75D. sph. ⊂> +3.25D. cyl. ax. 167°. The catmin lens was then ordered, and the examination revealed visual acuity R.E. 20/20 and L.E. 20/20. Maddox rod with correction revealed 6 prism diopters, base in, for distance and 20 prism diopters, base in, for near. The addition of plus or minus did not improve the vision. The deviation for near was corrected with a 5½ prism-diopter, base-in lens; the addition for near vision of a +2.75D. sph. over each eye was prescribed in the form of slipovers.

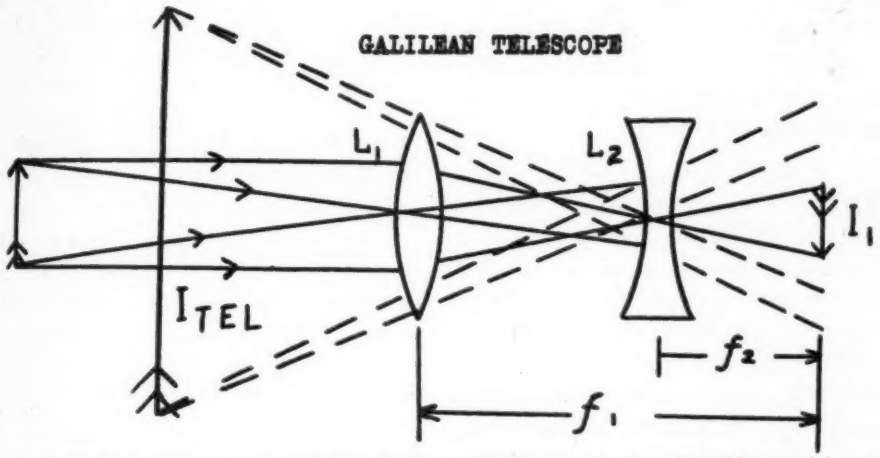

Fig. 2 (Kamellin). Diagram of Galilean telescope. In the catmin lens the object and image are reversed. (Courtesy of The House of Vision, Chicago.)

Case 3. Mrs. C. C. P., aged 37 years, noted loss of vision in the right eye. There was no history of injury, inflammation, or the use of drugs. Examination revealed vision with the R.E. sufficient for finger counting at one foot with good projection; L.E. 20/20−3 with correction. Slitlamp examination uncovered a mature cataract in the right eye with no precipitates on the cornea. Operation was advised on the right eye and performed on June 20, 1942. Postoperative refraction of the R.E. with a +12.00 D. sph. ⊂> +1.50D. cyl. ax. 5° gave 20/20 for reading; with a +3.50 D. sph. addition gave J1 at 13 inches. Maddox rod test with catmin lens gave 16 prism diopters for distance and 6 prism diopters, base down, for the right eye. The diplopia was corrected by a 12 prism-diopter base-in lens, and a 4 prism-diopter base-down lens for the right eye. The vision in the right eye was not improved by plus or minus sphere. The prism equivalent of 12 prism diopters, base in, and 4 prism diopters, base up, was placed in the correction for the left eye, but the patient still continued to have diplopia. Recheck revealed that the diplopia for distance was corrected by an 8 prism-diopter, base-in, and the near vision by a 2 prism-diopter, base-down lens for the right eye, and this was prescribed as

a 6 prism-diopter, base in, and a 2 prism-diopter, base-up, for the left eye. The patient returned in three months for a check-up and examination revealed vision with the R.E. 20/25−3, and with the L.E. 20/15.

Plus or minus sphere over the catmin lens did not improve the distance vision. Slipovers R.E. +2.50D. sph. and L.E. +1.00D. sph. improved the near vision. The patient continued to have a small amount of diplopia which was not so uncomfortable as before.

Case 4. Mrs. J. D., aged 55 years, noted loss of vision in the right eye which increasingly diminished over a period of five years. Examination revealed good light perception and good projection in the right eye, and 20/15 vision in the left eye. The right eye had a hypermature cataract. The lens of the left eye had no opacities. Operation on the right eye was advised and performed on November 3, 1943. Visual acuity by trial case with a +3.25D. sph. ⊂⊃ +3.00D. cyl. ax. 180° was 20/20−2. A catmin lens was ordered for the right eye and the visual acuity with this correction in place was 20/20−2. The patient was helped slightly by the addition of a +0.50D. sph. in front of the catmin lens. The Maddox rod test resulted in 4 prism diopters, base in, and 2 prism diopters, base down, for the right eye, with the catmin lens in position. Slipovers of +3.00D. sph. for the right eye and +2.50D. sph. for the left eye were then ordered for near; the distance correction for the left eye was ordered with a 4 prism-diopter base-in and a 2 prism-diopter base-up lens in it. The patient continued to have diplopia with this correction so the Maddox rod was rechecked and found to be 2 prism diopters, base in, for distance and no hyperphoria was present. The test revealed that she had less difficulty with a +0.50D. sph. over the left lens, so the correction for distance on the eye that had not been operated on was reordered with this change in it. This correction gave the patient no difficulty for distance or for near vision.

Case 5. Mr. H. C. B. was seen on December 10, 1940, complaining of loss of vision in the right eye. Corrected vision with the right eye was 20/100 and with the left eye 20/20. Slitlamp examination revealed a very dark nucleus in the lens and also distinct opacities under the anterior capsule of the right eye. Lens extraction from the right eye was subsequently performed on July 28, 1941. Examination with a trial case revealed vision with a +13.00D. sph. ⊂⊃ +1.50D. cyl. ax. 25° to be 20/15+. A reading addition of +2.00D. sph. was prescribed and permitted J1 to be read. The lens was ordered for the right eye. The patient received this type of lens because he complained of being unable to use the ordinary cataract lens. The test with a catmin lens showed vision of 20/40−2 with the right eye, and with the addition of +0.75D. sph. it was improved to 20/20. Maddox rod revealed 2 prism diopters, base out, and 8 prism diopters, base up, for the right eye. A +0.75 D. sph. was added to the catmin lens and to the correction for the left eye together with a 7 prism-diopter, base-down lens to the correction of the left eye. The patient then stated that the catmin was not so helpful as it had been before. His vision in the right eye was 20/25 with correction. Test revealed that a −0.37D. sph. improved the vision with a catmin lens, so this correction was ordered in the catmin lens for the right eye. Thereafter he got along well until he developed opacities in the left lens which progressed to such a point that operation was indicated.

Case 6. Mr. C. H., aged 16 years, gave a history of having been struck in the right eye. There was a traumatic cataract with a large iridodialysis of the outer half of the iris. Examination revealed that visual acuity in the right eye was limited to the perception of hand movements, with good projection in all fields; in the left eye the visual acuity was 20/25+2. When the injured eye quieted down an operation was performed (March 4, 1940) to replace the iris. This was done by grasping the iris and resuturing it to its previous position. The procedure was followed 15 days later by a corneal expression of the swollen lens cortex (March 19, 1940), and this operation was subsequently followed by a discission of the secondary membrane (September 10, 1940). Examination revealed that the fundus had some gray connective tissue in the macular area. Trial-case examination determined that a +9.00D. sph. ⊂⊃ +5.50D. cyl. ax. 140° gave vision of 20/50+. The catmin lens was prescribed for the left eye with a prism, base in and base up, incorporated for correction of the diplopia. Plus or minus spheres over the catmin did not improve the vision, which was 20/50+. The diplopia returned and it was impossible to correct it with prisms, for the patient seemed to avoid fusion. He subsequently suppressed the vision in the right eye while reading. However, he was using the catmin lens one hour daily and was advised to return for further checkups.

Case 7. B. M., a boy aged 10 years, was hit by a bullet from an air gun. X-ray examination revealed no foreign bodies present in the eye. Visual acuity with the right eye was 20/40; perception of hand movements and good projection with the left eye. The iris in the left eye was adherent to the lens capsule. The lens was opaque and dislocated. The tension was low. A discission of the lens was performed on July 1, 1939, and the lens subsequently became absorbed. Following complete absorption of the lens cortex, trial-case examination revealed that a +11.50D. sph. ⊂⊃ + 1.50D. cyl. ax. 75° gave vision of 20/20, with a +3.00D. sph. added for near. The catmin lens was ordered and the patient read 20/40 with it. The addition of a +1.00D. sph. improved vision to 20/25, so a catmin lens was increased by this amount. Diplopia was rectified by a 2 prism-diopter base-up, and 3 prism-diopter base-in lens over the eye that had not been operated on. The left eye continued to diverge and it was necessary to change the prism strength a number of times to correct the diplopia. This increase continued until a 20 prism-diopter base-in lens was required to correct the deviation. Surgery to correct the divergence was suggested, and an O'Connor cinch operation of the left internal rectus muscle and a fenestrating tenotomy of the left externus were performed on July 31, 1943. The residual deviation was corrected by a 3 prism-diopter base-in lens which was incorporated in the correction for the right eye. The patient's vision has remained comfortable since that time.

Case 8. A. H., a boy aged eight years, was playing with a button on a string, when it slipped off and struck him in the left eye. Examination revealed that vision with the right eye was 20/30 and that good light perception and projection were present in the left eye. There were remains of a traumatic cataract which filled the pupil. A discission was advised and performed on August 29, 1938. Trial-case test resulted for the left eye in a +12.25D. sph. ⊂⊃ +1.50 cyl. ax. 10°, with which vision was 20/25+3. A −.50 D. sph. over the left lens improved the

vision slightly and this correction was ordered for the catmin lens. The diplopia was corrected by a 12 prism-diopter base-in lens, and this was ordered as a slipover. Subsequent checkups revealed that the diplopia was corrected with a 5 prism-diopter base-in lens, and this was ordered for the correction in the right lens. He now has good fusion and good depth perception.

Case 9. Mrs. W. O. C., aged 40 years, was hit in the right eye by a piece of metal. When seen, vision R.E. was 8/200, and L.E. 20/15. Cortex was present in the anterior chamber, and the tension in the right eye was 52 mm. Hg (Schiøtz). A corneal expression was advised and performed, and a secondary discission subsequently was also done. Trial-case test of the right eye revealed that with a +11.25D. sph. ⊂⊃ +1.00D. cyl. ax. 180° vision was 20/20. The right eye subsequently developed a slight deviation, however, the catmin lens was prescribed and the patient had good fusion. The correction for near was added in the form of slipovers, and the patient is now comfortable.

Case 10. R. B., aged five years, injured his right eye two years previous to the first examination, and lashes were carried into the eye at that time. Examination revealed a large yellow mass on the iris extending to the pupillary margin and touching the cornea anteriorly. An iridectomy was performed on August 5, 1935; the patient subsequently developed a cataract. This was removed by discission and corneal expression on December 30, 1935. Trial-case examination revealed that vision with a +12.50D. sph. ⊂⊃ +2.00D. cyl. ax. 130° was 20/40 in the right eye. With an addition of +3.50D. sph. he was able to read J2. Occlusion of the left eye failed to improve the visual acuity. Recheck by trial case revealed in the right eye that a +10.50D. sph. ⊂⊃ +4.00D. cyl. ax. 115° gave vision of 20/40−, and this was ordered for the catmin lens. Diplopia was corrected by 15 prism-diopter, base-in lens. A −1.00D. sph. added to the catmin improved the vision to 20/30−2. The prism correction was ordered incorporated into the left lens and a slipover of +2.50D. sph. for near was prescribed for the right eye.

Summary

A. Advantages of catmin lens:

1. Catmin lenses are reversed telescopic lenses which are of value in certain cases of unilateral aphakia in children and in adults in which contact lenses cannot be used to maintain binocular vision.

B. Disadvantages of catmin lens:

1. Cosmetically the appearance of the lens leaves much to be desired.

2. The field of vision is restricted about 23 percent when this type of lens is used.

Conclusion

Catmin lenses are of benefit in many cases for the maintenance of binocular vision and may be added to the armamentarium of the ophthalmologist to be used in those cases in which the individual does not object to the appearance of the lens and also does not object to the restriction in the field of vision and in which contact lenses cannot be prescribed.

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SUMMARY OF REËXAMINATION OF ORTHOPTIC PATIENTS WITH CONSIDERATION OF PERMANENCE OF RESULTS*

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Memphis, Tennessee

For the past five months I have been engaged in a bit of research which has had to do with calling back and reëxamining former orthoptic patients. The purpose in mind was the securing of information which would lead to evaluating to some extent the permanence of results gained by orthoptic treatment.

An observation has been brought to my attention during visits to hospital clinics and during the accumulating of material for this report. There is a vast difference in the proportion of various types of cases dealt with in clinic work and in a private office. In an office that deals mainly with private patients we naturally find a greater percentage of phorias and discomfort cases.† The clinic patient goes to be treated for the most part for some very evident condition. The private patient goes more routinely for minor conditions as well as for manifest ones. This gives us many uncomfortable adults who must be taken care of, and rightfully so.

In our particular situation it is also a fact that many patients are seen from the Tri-State area. Consequently these patients are not often accessible for rechecking. There are many cases of squint among these Tri-State patients who make the effort to come some distance for good attention in a city, but who cannot be secured for any prolonged treatment. We often experience disappointment in having to be satisfied with a cosmetic result when everything in us longs to make it a functional one.

May I recommend to orthoptic technicians this checking back process as a stabilizer as far as hopes and expectations are concerned. It is very easy to become temporarily overconfident when gratifying results appear in groups. It is just as easy to question the value of work done when for a period of time expected results are simply not forthcoming. After reviewing a series of cases a mental settling down takes place, together with the realization that only by continued plodding along, incorporating or discarding new techniques as they are proved, taking ups and downs as they come and profiting by them, is real progress made.

Please bear in mind that the following cases are not presumed to be spectacular in any way. They are but examples of the general run of orthoptic patients seen and treated in ordinary private practice. The photographs are shown not to display orthoptic skill in having secured the results, for every orthoptic clinic can show similar work done. In this discussion the objective is to ascertain the condition of the patient several years later as compared with that at cessation of treatment.

This report is made on the reëxamination of 50 orthoptic cases. The time that has elapsed since these patients were treated ranges from two to nine years. These cases have been divided into two groups. In the first group are included some tropia and some phoria cases, but all with demonstrable deviations which at the time were or might later have become disfiguring. Although it is impossible to group cases as identical ones, I have tried to present as far as possible

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* Presented before the Symposium on Orthoptics, American Academy of Ophthalmology and Otolaryngology, at Chicago, in October, 1944.

† I should mention here that ours is a central office to which patients are referred by ophthalmologists of the entire city and surrounding area.

cases that come under general classifications rather than those with unusual individual peculiarities, for these would be more generally indicative of what permanent results can be expected from orthoptic treatment.

Six patients with accommodative convergent squint were called back for examination. The résumés will necessarily be brief.

Case 1. B. J. R., a child aged five years at the time of her first visit, 10 years

Fig. 1 (Robinson). Case 1. Accommodative convergent squint at five years of age. Fig. 2, same case 10 years later, following orthoptic treatment.

ago in July, 1934, had an accommodative convergent squint of 20^{Δ} (fig. 1). Her mechanical deviation had been corrected by a recession of the right internal rectus. Vision of her left eye was corrected to 20/20 by a +3.50D. sph., and the vision of her right eye was 20/70 with a +3.50D. sph. $\bigcirc$ +3.00D. cyl. ax. 90°.

Orthoptic treatment combined with occlusion was administered for 10 months. Six years later the patient returned and was treated for three months.

An examination in June, 1944 (fig. 2), revealed corrected vision 20/15 and 20/20. She had orthophoria for distance and 3^{Δ} of exophoria for near with and without glasses. Prism divergence was 5^{Δ} and prism convergence 22^{Δ}.

This result was obtained and maintained with surgery, refraction, and orthoptic treatment, in addition to the time and effort expended by the patient. This last factor should not be minimized. From all indications, neglect of any one of these factors would have prevented the attainment and permanence of the present result.

Case 2. F. D., a child four years of age, was seen eight years ago. His original condition presented an accommodative squint of 30^{Δ}. Vision of the right eye could be corrected to 20/20 with a +3.00. sph. $\bigcirc$ +1.00D. cyl. ax. 90°; vision of the left eye could be corrected to 20/100 with a +4.50D. sph. $\bigcirc$ +1.00D. cyl. ax. 90°.

Treatment consisted of supervised occlusion for seven months and orthoptic training for the next year combined with partial occlusion by means of lacquer and strips. Further treatment was resumed five years later for six months.

In June of this year the child was examined. His eyes are now parallel with and without glasses, with ease. Corrected vision is 20/20 O.U. Prism divergence is 5^{Δ}. Prism convergence is 20^{Δ}. He dispenses with his glasses at will, with comfort and increasingly clear vision.

Case 3. G. W., a girl aged four years had an original accommodative squint of 30^{Δ}. She was wearing a +3.00D. sph. O.U. with 20/30 vision in each eye. Treatment carried out for two years with intervening rest periods resulted in straight eyes with and without glasses.

Examination this summer, two years later, revealed eyes in excellent position, no difficulty of any kind being experienced for near or distance vision. Her correction has been reduced to +1.50D. sph. O.U. and is worn only for close work.

Case 4. E. A. was first seen in June, 1934. Her squint without glasses was 24^{Δ}. With an approximate correction of a +2.00D. sph. O.U. the vision of her left eye was 20/25, right eye 20/50−. She

was dismissed after 10 months of orthoptic treatment.

Nine years later her condition was checked (July, 1944). Findings were: orthophoria for distance and near with and without glasses, prism divergence 8Δ, prism convergence 23Δ. Her vision is 20/20 O.U. without glasses. She wears glasses only occasionally. When extremely tired she notes a little turning of her right eye.

Case 5. J. B. presented another accommodative case of squint and was examined six years after the completion of treatment. Her vision in 1938 was good in each eye with very small correction. Esophoria for distance measured 11Δ, for near 22Δ. Treatment was given for two months.

A recent examination of this child showed an esophoria of 12Δ under cover for near, but she could not hold this position long. She habitually held her eyes straight.

This, however, is an example of a patient dismissed too soon. She controls the position of her eyes with ease, under normal conditions, but that control might easily become difficult under stress. In all probability, had treatment been carried out over a longer period originally, her eyes would be more permanently parallel now. This checking back has provided the opportunity to correct the earlier error and give further treatment now.

Case 6. H. W., aged four years, had a case of convergence excess with no refractive error. His vision was 20/20 in each eye. When first seen his eyes were parallel for distance, but the left eye turned in 35Δ at near. He had double vision immediately on the inshoot of the left eye, which occurred almost constantly when an object 3 feet or nearer was fixated. There was a small vertical deviation measurable only in the upper fields. This was not deemed sufficient to require attention.

Orthoptic treatment was given over a period of 12 months, with several two-week rest periods intervening. A smoked lens was worn over his right eye when he was doing close work. At the end of the year's work he held his eyes parallel with ease at any distance and had excellent third-grade binocular vision. Home treatment was continued for three months.

Two years have passed, and his mother reports no overconvergence at any time. Much credit goes to the patient in this case. His coöperation was almost unbelievable for his age.

Comment. It would seem from this review of accommodative convergent cases selected at random that patients with this anomaly can be given orthoptic treatment with some degree of assurance as to the final permanent outcome. Requisites are treatment extended over a prolonged period plus home training, with constant checking and much emphasis on the cooperation of the patient. When the refractive error is not too great and astigmatism does not play too large a part, the reduction of the correction and many times almost complete elimination of glasses can be anticipated. A wise course to follow appears evident; that is, watching and examining a dismissed patient over a period of several months following treatment.

Next there are three cases of esotropia which required surgery and orthoptic treatment. These results have all been held satisfactorily. In brief they are:

Case 7. L. C. G., an 11-year-old girl was first seen in 1935. She had a convergent squint of 33Δ which appeared to be alternating. She was wearing O.D. a +3.50D. sph. ⊂⊃ +1.25D. cyl. ax. 70°, and O.S. a +2.50D. sph. ⊂⊃ +1.75D.

cyl. ax. 90°. Corrected vision was 20/20 in each eye. The squint was purely mechanical. Heteronymous diplopia denoted false projection.

Two months of orthoptic treatment preceded surgery, which consisted of a resection of the right external rectus muscle and a recession of the right internal rectus. Immediately following operation her eyes were parallel for distance with 8Δ of exophoria present for near and a troublesome persistent diplopia. Two months' daily fusion training resulted in single binocular vision with fair fusion amplitude and stereopsis.

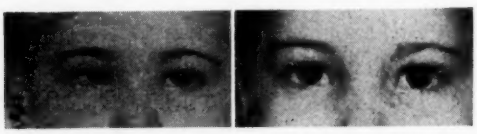

Fig. 3 (Robinson). Case 8. Alterating convergent squint. Fig. 4, same case two years later, following surgery and orthoptic training.

Her eyes were examined this summer, five years after treatment was given. They are parallel for distance with and without glasses, with 5Δ of exophoria for near. Prism divergence is 7Δ; prism convergence is 23Δ. She does not wear her glasses most of the time and reports comfort.

Case 8. M. T., four years old, was first seen when she had an alternating convergent squint 50Δ (fig. 3).

Her vision was equal and fusion present at the true angle. After a recession of both interni her eyes were straight until eight months later, when she was frightened in a tornado. After this incident a convergent squint of 38Δ appeared, first on alternate days. Orthoptic treatment given first twice a day and then once a day for a month followed by home treatment with a stereoscope resulted in consistently straight eyes.

This picture was taken in the summer of 1944, two years after treatment was given. No return of incoördination has been noted.

Case 9. B. M., first seen seven years ago, when she was four years old, had a left esotropia of 25Δ. Her vision had been made equal by occlusion. She was wearing a +1.50D. sph. in each eye. After a recession of the right internal rectus she had double vision, and exophoria measured 12Δ. Daily treatment for two months eliminated double vision and developed fusion with some amplitude and stereopsis.

Examination this summer revealed excellent position of the eyes, with no report of turning since treatment had been discontinued. Vision was 20/20 in each eye. Measurements were: distance 1Δ exophoria, near 5Δ exophoria, prism divergence 5Δ, prism convergence 20Δ, immediate recognition of stereopsis.

Comment. These operative cases of esotropia are all individual problems, but a few general statements can be made. For a successful permanent result, the following steps are the ideal course to follow: the overcoming of amblyopia when present, preliminary orthoptic treatment, surgery for the elimination of the mechanical deviation, followed by further orthoptic treatment. Many complications arise and often there is no opportunity to carry out the desired course of treatment. May I make one observation here? We have not always found it possible to break down false projection and build up fusion ability at the true angle before operation, but I believe that even if this goal is not reached before surgery is carried out, the macular stimulation given in the attempt to develop fusion is of distinct advantage postoperatively, in that fusion comes about more quickly and can more easily be made permanent.

A review of 14 cases of divergence excess gives briefly the following findings:

Two nonoperative cases in patients who showed a combined divergence excess and convergence insufficiency responded well to treatment and the patients have held what they gained.

Case 10. B. J. C. had an original divergence excess of 20Δ and a convergence near point of 15 cm. together with a slight vertical deviation measurable only in the extreme upper fields. Her vision was equal, the refractive error negligible. After a period of five months of binocular training she had single binocular vision at all times with excellent amplitude of fusion. After two years she was found to be holding the correction achieved without effort.

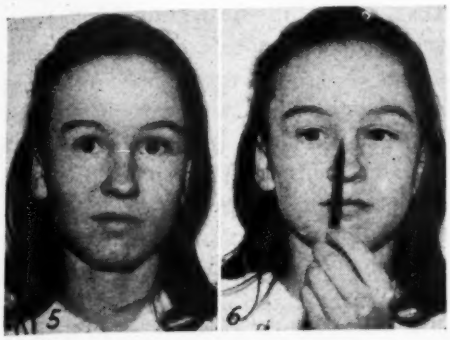

Fig. 5 (Robinson). Case 11. Divergence excess. Position of the eyes for distant vision. Fig. 6, same case. The position of the eyes when convergence was attempted.

Case 11. The other divergence-excess case with combined convergence insufficiency was presented in L. J., aged 10 years. Figure 5 shows the position of her eyes on looking at distance, before treatment. Figure 6 shows an attempt to converge.

After two months of treatment and two years' absence, fixation at distance is shown in figure 7, and easy convergence ability in figure 8.

The next two cases demonstrate the frequent disappointing results seen in cases of divergence excess. They are typical examples of the persistence of a very evident deviation even after the development of excellent binocular coördination. The gain made in each case was beyond expectations as far as vergences and voluntary control were concerned. At the end of a prolonged series of treatments the disheartening observation of a frequently wandering eye was made. On examining these patients after absences of three and four years, respectively, the same frequent outward deviation was noted, but none of the binocular skill developed had been lost. Both of these patients were very slightly hyperopic.

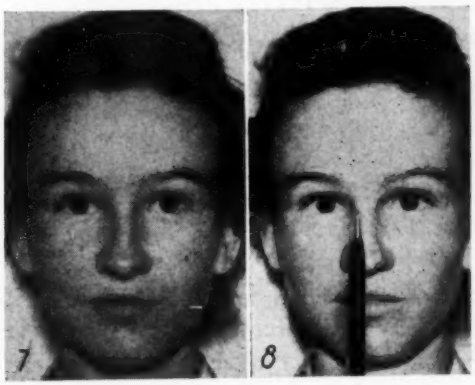

Fig. 7 (Robinson). Case 11. After treatment and two years' interval; fixation for distance. Fig. 8, same case, convergence ability.

Case 12. B. J. B., when seen at the outset of treatment, showed a divergence as illustrated in figure 9. Figures 10 and 11 show the eyes straight, and divergent, as seen when examined four years after treatments had ceased.

Fig. 9 (Robinson). Case 12. Divergence excess. Figs. 10 and 11, same case four years later. Eyes straight and deviation; binocular skill, however, retained.

Comment. Four cases of divergence excess with false projection noted in the original examination are reported. In all four cases false projection was broken down and fusion amplitude developed. As each of these patients was reëxamined after an absence of nine years in each case, it was noted that most of the amplitude built up remained, although each patient reported that under stress occasional divergence was noted.

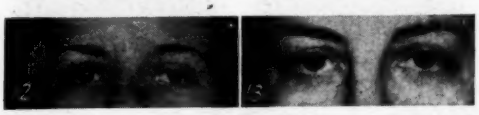

Fig. 12 (Robinson). Case 14. Divergence excess before treatment. Fig. 13, same case six years after surgery and orthoptic treatment.

An interesting observation is that in none of these cases was there any trace of reversion to false fixation. True projection was present in every instance, giving emphasis to the belief that even though the tendency to diverge was not eliminated by orthoptic training, the ability to overcome it was of sufficient strength and permanence to prevent anything but momentary loss under stress of binocular vision.

I believe it is the consensus of opinion that both time and effort are put to little use in attempting to develop binocular coördination by orthoptic treatment alone in patients with a divergence excess. This belief is borne out in many instances and has been demonstrated by two previous cases reported here. However, the degree of improvement held in these last four cases I believe gives justification to the expenditure of a fair amount of work and time in at least selected cases. It is true that perhaps surgery and orthoptic treatment combined would have been more advisable, but much was gained and held by orthoptic training alone. The fact that we can never know what we prevent leaves us with an uncertain argument, but it seems plausible to suggest that the elimination of false projection in these last cases prevented a possible permanent squint. The obvious conclusion is the realization that each patient is an individual to be dealt with and no two cases come under identical classifications.

The next five cases are of divergence excess in which treatment by surgical correction and orthoptic training was given.

Case 18. E. B. was examined nine years ago when she had an excess of 40$^{\Delta}$ and equal vision. Her refractive error was −1.00D. sph., O.U. Fusion and convergence training was given for five months. A recession of the right externus was then performed, leaving 20$^{\Delta}$ of exophoria to be taken care of by orthoptic treatment, which was administered for four months.

In 1944, five years later, her eyes were found to be habitually in excellent position. She has a demonstrable exophoria to 15$^{\Delta}$ for distance and 4$^{\Delta}$ for near. This deviation, however, is entirely held in check by a still present prism convergence of 60$^{\Delta}$. No discomfort nor inconvenience is experienced now.

Case 19. A. M. had a divergence excess of 22$^{\Delta}$ in 1938. A tenotomy of the right external rectus had been done eight years before. A good result was achieved by two months' treatment.

Reëxamination this summer, six years after treatment was given, shows fusion amplitude still good, the patient comfortable, and the eyes parallel most of the time. The following pictures (figs. 13, 14) show her before treatment and at the present time.

Case 20. E. D. had an alternating divergence excess of 29$^{\Delta}$ in 1937. True fusion ability was present but was held only momentarily. A correction of a −3.00D. sph., O.U. was worn. Both externi were recessed, leaving an exophoria of 11$^{\Delta}$. This patient lived out of town and was given fusion training at home with a

stereoscope and suitable cards, with return visits for supervision of training. This was kept up for 14 months after operation. Examination six years after treatment was stopped showed an exophoria of 4Δ for distance and 5Δ for near.

Case 21. E. S. had an alternating divergence excess of 60Δ in 1941. Both external recti muscles were recessed, leaving 35Δ of divergence excess. Treatment was given for two months. The patient was dismissed with eyes in good position and excellent fusion amplitude. She was checked two years later: the eyes are parallel most of the time, but the divergence tendency is not always held in check when the patient is tired or ill.

Case 22. B. M. had an original divergence excess of 29Δ and amblyopia of the left eye with vision 20/70. He was wearing a +.50D. sph. ⊂⊃ +.50D. cyl. ax. 90°, O.U. Occlusion for one year resulted in equal vision in both eyes. Surgery brought about an overcorrection of 8Δ, with a troublesome diplopia. Orthoptic treatment was given for four months, at the end of which time the patient was dismissed to continue home training with a stereoscope and base-in cards.

Four years later he had orthophoria for distance and near, with 5Δ of prism divergence and 17Δ of prism convergence. His vision is 20/20 in both eyes, and he is comfortable.

Comment. The amount of improvement held in these operative divergence-excess cases varies, but the percentage of gain that remains is high. Indications in some instances are of a longer training period, in others of a more complete surgical correction. But outstanding still is the factor of individual effort and response.

In this last group, consisting of 28 insufficiency cases, the most interesting reply to the inquiries made came from the South Pacific from a former medical student who needed better binocular coordination to enable him to study more comfortably. In his own words he can see the bombs falling easily but with some discomfort!

Of these 28 insufficiency cases, I was able to secure information concerning only one patient, whose difficulty had been divergence insufficiency. In the treatment of this condition of very uncertain prognosis I believe determined effort had much to do with the improvement recorded and held in this instance. This person was in the ministry but had a great desire to go into teaching and research work. He hesitated to make the change because of the discomfort caused by close work. His measurements were an esophoria of 15Δ for distance, and 10Δ for near. He had no refractive error. His vision was 20/20, O.U. A sense of fusion and stereopsis was present.

The home use of base-in cards with a stereoscope together with scattered office treatments during the next seven months resulted in almost complete comfort in the use of his eyes and enabled him to accept the position offered. His esophoria at that time measured 5Δ for distance and near; prism divergence 7Δ, prism convergence 45Δ. He left the city and was not heard from until he answered my letter this summer, having left equipped with a stereoscope and suitable cards to be used as he felt the need.

His reply, recently received, follows in part: "It has been more than a year since I have done any of my eye exercises. During the past 10 months I have spent most of my time reading and have experienced very little inconvenience. I am writing this after 8 hours of comfortable reading."

This, again, is an example of the individuality of response to treatment. I would hesitate to make an overall statement concerning permanent or temporary

response of patients with divergence insufficiency. This encouraging instance, however, shows what is possible even if in isolated cases.

With regard to the most easily treated and most rapidly relieved group of patients—the convergence-insufficiency group—I should like to make a few preliminary observations. First, *concerning the need for treatment:* There are many persons, particularly adults, who are handicapped in their daily occupations because of a lack of comfortable binocular coördination, especially for near vision. When correction of this condition is not made, these persons become dissatisfied patients who constantly seek relief by means of a change in their refractive correction. Their discomfort is many times dismissed lightly; but a medical student who cannot study with comfort or a draftsman who cannot execute his work accurately or a banker who sees his clients double across his desk or even a homemaker who cannot sew with ease should not be ignored. This group must be dealt with regardless of the time consumed. I believe it is of the utmost importance to rehabilitate these uncomfortable patients.

Concerning *symptoms and measurements:* These vary greatly and are often contradictory. One person may be just as uncomfortable with a convergence near point of 3 cm. as the next one is with a convergence near point of 15 cm. The most reliable indication as to the need for convergence training is, in our experience, the taking of vergences at near during reading. This is commonly called the *reading ratio.* I mention this because this ratio was the one finding in all of these 26 rechecked cases that was constant in showing the cause for the original discomfort.

With regard to *permanence of progress made:* We have found in this group a consistent report of subjective improvement held and findings of from 90 to 100 percent of improvement made still present according to objective measurements after from two to eight years' absence. Two of these cases were in children whose poor reading habit was traced directly to poor convergence ability. The most definite promise of permanent improvement and relief from symptoms can be made in cases of convergence insufficiency.

Conclusions

A few facts may be mentioned concerning what can be generally anticipated with regard to permanent results obtained by means of orthoptic treatment.

First, that the potential response of each patient is a deciding factor to be considered. Treatment of necessity must be given in the light of former experience but always with the awareness of the individuality of the patient.

Second, that orthoptic treatment is a necessary adjunct to the treatment of squint, but failure to realize its limitations will lead to disappointing results. It cannot replace other necessary measures, but neither can its place be taken by any other procedure. The use of orthoptic treatment is essential to a functional permanent result, and with constant striving that use may extend beyond present realizations.

Third, that by means of orthoptic treatment the tendency of an eye to deviate is often not eliminated, but the ability to overcome this tendency is strengthened so that the deviation is not troublesome.

Finally, that the obtaining of a good permanent result does not depend upon the degree of squint nor the amount of amblyopia present, but rather upon the correct diagnosis of the condition and the treating of this condition by various methods put to use in logical sequence.

Exchange Building.

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Discussion

Dr. E. C. Ellett (Memphis): Miss Robinson's interesting contribution reminds us all how important the matter of records is, for by records alone can we follow such work as this, study the progress or lack of it that attends our efforts, and not only profit by it ourselves, put pass it on in such a convincing shape that others will accept it as correct. The excellent photographs which lend so much to the report are a most valuable and convincing part of the records, and I know it to be true that these too are Miss Robinson's own work.

PENICILLIN TREATMENT OF TRACHOMA

A preliminary report

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In June, 1944, when penicillin was first made available to the United States Indian Service hospitals, its use in the treatment of trachoma was initiated at the Cass Lake, Minnesota, Indian Hospital. As sulfanilamide, in the past, has been used extensively and with specific success in the treatment of the disease in this locality, some difficulty was experienced in finding a sufficient number of typical and unquestionably active cases of trachoma for trial with penicillin.

To date, 12 cases, ranging from the typical textbook type I to the chronic type III, have been treated. Since no other reports of treatment of definite unquestionable cases with penicillin have appeared and since results in this series have been so encouraging, it is believed that a preliminary report is indicated, even though only a short time has elapsed since these cases have undergone treatment.

To be classified as typical active trachoma, in the acute stage, a case should exhibit the following symptoms in varying degree: lacrimation, photophobia, diminished vision, and a granular sensation, subjectively; objectively, hyperemia, swelling, subepithelial follicles or granulations of the palpebral conjunctiva. In the more chronic affections, there should be a thickened, hyperemic, velvety, palpebral conjunctiva extending to the retrotarsal folds, or a thickened and scarred palpebral conjunctiva with scattered islands of hyperemic granulation tissue. The palpebral conjunctival vessels should usually be invisible. In all cases of active trachoma, either acute or chronic, pannus must be present. Pannus may be either grossly evident or may require the aid of the slitlamp to be seen.

Only cases exhibiting most of the aforenamed typical findngs of trachoma were used in the series. Pannus of vary-

ing degree was present in all 12 instances.

As at the time of the initiation of the investigation there was no precedent to follow, it was decided, as a trial, to employ topically the sodium salt of penicillin in a solution of 500 units to each cubic centimeter of water rather than to administer the drug paranterally. Thus, a high concentration was obtained where most needed. Since then it has been reported that topical application is the preferable method of administration in ocular diseases affecting the anterior surface of the globe and the conjunctiva of the lids.[1]

At the onset, only a three-day supply of the solution was prepared each time, and this was kept under refrigeration. Drops of this solution were instilled by the nurse every three hours during the day. Later, when it was reported that penicillin solutions retained their potency for approximately a week at room temperature,[2] the policy of leaving a one- or two-day supply at the patient's bedside was adopted, the patient being instructed to instil two drops in each eye every half hour when awake. In addition, the instillation of drops every three hours was continued, thus making certain that, in case the patient was negligent, some treatment was being received. Under the original three-hour schedule, improvement in all cases was observed, but this improvement was more rapid under the half-hour schedule.

In this series, as with sulfanilamide, loss of photophobia and lacrimation was the first change observed, this improvement being noticed following 24 to 48 hours of treatment. Improvement in vision was usually evident on the third day, as was paling and thinning of the hyperemic palpebral conjunctiva, with gradual flattening of follicles and granulation tissue. Beginning shrinking and retraction of vessels of the pannus was definite on the fifth to the seventh day, with accompanying slower clearing of the gray corneal pannus infiltrate. Rapid healing of complicating corneal erosions and ulcers was the most spectacular improvement observed.

The average period of hospitalization, in the series, was 19 days. As most of the cases came from isolated and distant regions to the Hospital, postdischarge follow-up was difficult. Six of the patients were seen approximately six weeks and again five months following cessation of treatment. Improvement beyond that present on discharge was evident in all.

Although a series of 12 cases, only 6 of which were observed following discontinuance of therapy, is inconclusive evidence that penicillin is a specific in the treatment of trachoma, it is felt that the marked improvement noted in each instance is sufficient to encourage further work with the drug by those treating trachoma. The improvement observed is in no way superior nor more rapid than that obtained by the well-established sulfanilamide therapy introduced by Loe of the Indian Service,[3] except that penicillin may offer a solution in the treatment of sulfanilamide-resistant or sensitive cases.

The following two cases are illustrative of the response to penicillin therapy.

Report of cases

Case 1. D. F., an eight-year-old Indian boy with an essentially negative past history was admitted to the Hospital on August 25, 1944, for treatment of "sore eyes." Physical examination on admission was essentially negative with the exception of the eyes. These presented a typical type I trachoma, evidenced by marked reddening and thickening of the palpebral conjunctiva, with the presence of many typical follicles on both lids, mainly the upper. A moderate well-vascularized pannus was present on both corneas. Photophobia and lacrimation with morning crusting of the edges of the lids were

marked. Instillation of drops of penicillin sodium, 1:500 solution, was initiated on the day of admission. On August 31st, marked paling of the palpebral conjunctiva and decrease of follicles were evident. Photophobia, lacrimation, and crusting were absent. On September 8th, the follicles had decreased markedly and were paler than the rest of the mucosa. The previously red and velvety conjuntiva was pale; its vessels, previously invisible, were now clearly seen. On September 27th, the date of discharge, the conjunctiva of the lids was pale, no thickness nor follicles were present, and the conjunctival vessels were clearly visible. The previously well-vascularized pannus was devoid of vessels and had retracted to near the limbus. The vision, which had been 20/80 on admission, was 20/30 on the date of discharge. On January 15, 1945, the vision was 20/20 and no evidence of activity was present.

Case 2. J. R., a 67-year-old, well-nourished, healthy-appearing, full-blooded illiterate Indian male, who had had no past illnesses of note, was admitted to the Hospital on August 25, 1944, for treatment of trachoma, which had been present since he was a young man. Past treatment had consisted of irregular use of copper sulphate and grattage 15 years previously. There had been no sulfanilamide therapy. His brother, sister, and two nephews, examined one month previously, all had active trachoma. Examination of the eyes disclosed narrowing of both palpebral fissures, moderate photophobia, crusting of the edges of the lids, and many islands of velvety-red granulations on the conjunctiva of both upper and lower lids. Marked pannus was present on both corneas, with vascularization extending to the extreme edge of the pannus. He was unable to look out of the Hospital window without marked squinting and was unable to count the number of fingers held 60 inches before him. Treatment by instillation of drops of 1:500 solution of penicillin sodium every half hour was initiated on the date of admission. Three days later lacrimation and photophobia were absent, the islands of granulation tissue were much paler, and he was able to count the number of fingers held 60 inches before him. On September 6th, 12 days after the onset of treatment, the islands of granulation tissue were gone, and the palpebral conjunctival vessels were evident. The previously marked pannus vascularization had almost completely disappeared. The gray pannus infiltrate had become more transparent and had retracted considerably. On September 8th, the penicillin drops were discontinued because of the onset of an acute hyperemia of the scleras. This was thought to be due to the penicillin, as the injection disappeared following cessation of the penicillin instillations. At the time of his discharge from the Hospital, on September 18th, the mucosa of the lids was pale and devoid of granulation; the individual vessels were visible. There was no photophobia, lacrimation, nor crusting. The pannus had receded to three fourths its original size, had become less dense, and was devoid of vessels. The patient stated that he could see better than he had been able to since youth. The improvement was still present five months later.

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NOTES, CASES, INSTRUMENTS

BOECK'S SARCOID WITH UVEOPAROTITIS AND DACRYOADENITIS*

Report of a case

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Following the adoption of the misnomer "sarcoid" by Caesar Boeck,[1] in 1899, for skin lesions which resemble sarcoma, this disease, under various titles, has stimulated much interest in practically all the fields of medicine. The first modern concept of this widespread systemic disorder was defined by Schaumann[2] in 1916, who recognized it as a chronic, relatively benign granuloma which may involve any organ or tissue, with special predilection for the reticuloendothelial system. This concept has been further developed, especially in recent years, by many authors, including Reisner,[3] Harrell,[4] and Woods and Guyton.[5]

Sarcoidosis occurs most frequently between the ages of 20 and 30 years, and is preponderant in Negroes. Its prognosis is generally favorable, spontaneous resolution of the lesions frequently occurring during its protractive course. Lymphadenopathy, either general or local, is almost constantly present at some stage of this disease. The lungs are affected almost as frequently, though the physical findings are often sparse. Roentgen examination usually reveals diffuse reticular infiltration which extends toward the bases, associated with hilar enlargement. Cutaneous lesions are present in 50 percent of the cases and appear as firm swellings of the superficial (Boeck) or deep (Darier-Roussy) type. Characteristic cystlike changes in the small bones of the hands or feet occur in about 15 percent of these cases.

The characteristic lesion in Boeck's sarcoid is the "hard" tubercle, which is composed of an accumulation of epithelioid cells interspersed with some giant cells of the Langhans type and surrounded by sparsely scattered lymphocytes. Central necrosis and caseation is usually absent, and healing occurs by fibrosis.

The cause of sarcoidosis is yet unknown. No virus nor bacteria have thus far been isolated. The treatment is symptomatic, aided by general supportive measures.

Ocular involvement

The eye and its adnexa are frequently involved in sarcoidosis. The ocular symptoms, in fact, may be the first to manifest themselves in this disease. Any of the ocular structures may be involved, including the lids, conjunctiva, lacrimal glands, cornea, sclera, orbit, and fundus. The most common ocular lesion, however, is infection of the uveal tract. Schumacher,[6] in 1909, was the first to describe iritis in Boeck's sarcoid. Since then, uveitis in sarcoidosis has frequently been reported and its incidence has varied from 5 percent (Osterberg[7]) to 28 percent (Levitt[8]). Woods and Guyton[5] estimated that 2 to 3 percent of all cases of chronic uveitis may be due to sarcoidosis.

Uveitis may occur at any stage of sarcoidosis and is usually bilateral. It resembles tuberculous iritis clinically, although its course tends to be milder. The uveitis may assume the benign chronic, serous form, or the more extensive nodular type. Unlike tuberculous nodules of the iris, these tend to resolve without leav-

* From the Eye Section, Lovell General and Convalescent Hospital.

ing appreciable scars. Though the uveitis tends to heal spontaneously, ocular sequelae in the form of keratitis, secondary glaucoma, and phthisis bulbi are not infrequent.

The association of chronic uveitis with parotid swelling, a syndrome first described by Heerfordt[9] as uveoparotitis, has been recognized by recent investigators, including Longcope and Pierson,[10] Scott,[11] and Walsh,[12] as a phase of sarcoidosis. Mikulicz's syndrome, characterized by enlargement of the lacrimal and salivary glands, has also been considered by some writers, including Hamburger and Schaeffer,[13] as a manifestation of sarcoid. This conclusion is confirmed by King[14] after histologic study of parotid glands removed from three patients with Mikulicz's syndrome. Further study will, no doubt, support this trend to regard both Heerfordt's and Mikulicz's syndromes as variable manifestations of sarcoidosis.

This case of Boeck's sarcoid is reported because of the unusual association of uveoparotitis and dacryoadenitis. It also offers further evidence that Heerfordt's disease and Mikulicz's syndrome, which had often been regarded as separate clinical entities, are both manifestations of sarcoidosis.

Report of a case

A colored soldier, aged 24 years, was apparently well until April, 1944, when he began to notice occasional pain in the left side of the chest, associated with cough and increased fatigue upon exertion. These symptoms, together with a gradual loss of weight, became progressively worse and necessitated his admission into a station hospital on June 13, 1944. Four days after his hospitalization, he began to develop swelling and tenderness of both parotid glands as well as of the lacrimal glands. Redness of both eyes became apparent a week later and was associated with an appreciable diminution of vision. Studies failed to reveal any evidence of pulmonary tuberculosis. He was transferred to this general hospital on July 6, 1944, for further observation and treatment.

His father died of pulmonary tuberculosis at the age of 39 years. The mother died at the age of 29 years from a cause unknown. One brother is living and well. The patient had worked on a farm in Arkansas till he was inducted into the Army in December, 1942. He has been married four years and has two children living and well. Except for the usual exanthematous diseases and pneumonia at the age of 16 years, he had previously enjoyed relatively good health.

Physical examination revealed a moderately debilitated and malnourished colored soldier weighing 140 pounds, who was mildly febrile. Both lacrimal glands were tender and symmetrically enlarged to the size of a small walnut (figs. 1a and 1b). The parotid glands were firm and slightly swollen, though painless. Discrete, insensitive lymph glands, the size of a pea, could be palpated in the posterior cervical, supraclavicular and inguinal regions. The chest was clear except for some moist rales at the base of the left base. Neurologic examination revealed no abnormalities. No cutaneous lesions were observed. The liver and spleen were not palpable.

Ocular examination. Vision in the right eye was reduced to 20/200; in the left eye it was 20/400. The lacrimal glands were enlarged as previously described. A mild mixed injection of the bulbar conjunctiva was present bilaterally. Tension (McLean) was 20 and 22 mm. Hg in the right and left eye, respectively.

Biomicroscopy revealed evidence of severe iridocyclitis in both eyes, more marked in the left. Numerous keratitic precipitates, consisting of fine, gray ex-

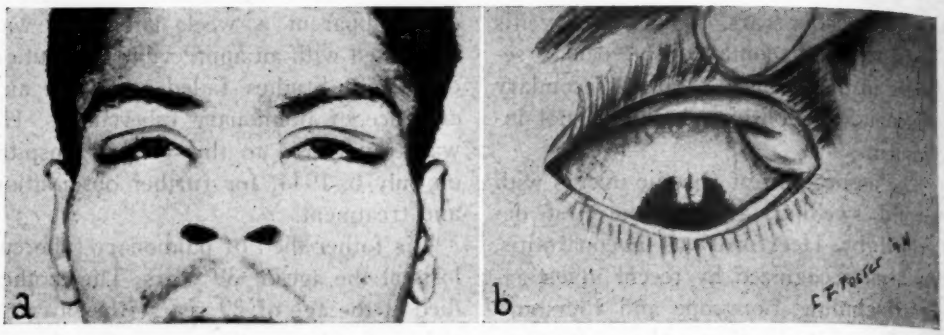

Fig. 1 (Schultz). Boeck's sarcoid. a, Showing enlargement of both lacrimal glands. b, Appearance of the enlarged lacrimal gland of the left eye after the upper lid was everted.

udates and larger mutton-fat deposits were observed on the posterior surface of each cornea. Iris pigment was profusely scattered over the anterior capsule of each lens, especially about the borders of the dilated pupils. The aqueous humor as well as the vitreous of each eye contained many fine cells and appeared turbid. Both fundi appeared normal except for hyperemia of the discs.

Roentgenographic observation. Roentgen examination of the chest revealed diffuse radicular infiltrations throughout both lungs, more marked in the left (fig. 2). The apices were not involved. Bilateral enlargement of the paratracheal and hilar lymph nodes was also present. A roentgenogram of the hands (fig. 3) revealed cystlike areas in the heads of the left second, third, and fourth metacarpals.

Laboratory studies. The blood showed a mild anemia with normal hemoglobin content. The white cell count varied from 5,450 to 9,200 per cubic millimeter, lymphocytes averaging 41 percent, and monocytes 5 percent. Repeated examination of

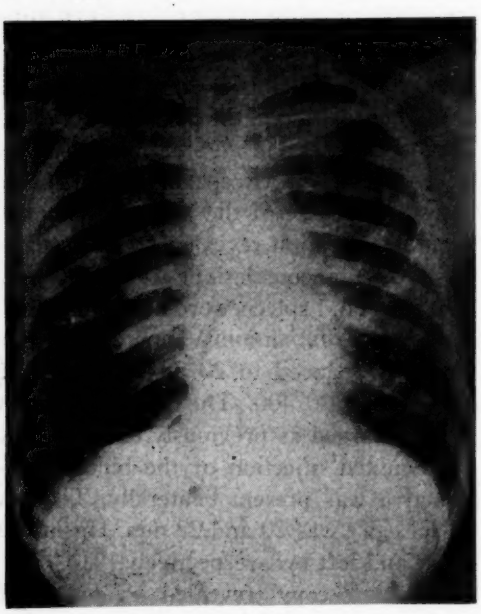

Fig. 2 (Schultz). Roentgenogram of the chest, showing enlarged hilar shadows and radicular infiltrations throughout both lungs.

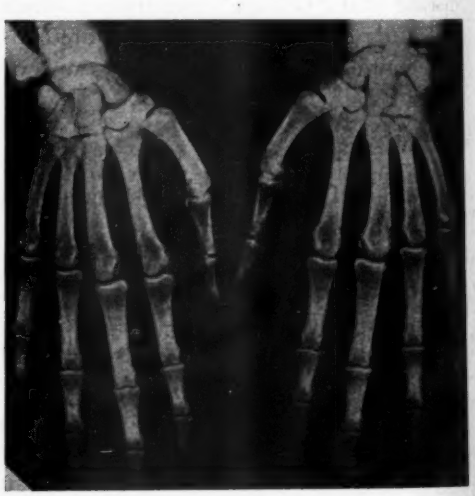

Fig. 3 (Schultz). Roentgenogram of the hands showing areas of rarefaction in the heads of the left second, third, and fourth metacarpals.

the sputum revealed no acid-fast bacilli. The Mantoux reaction was negative with 0.1 mg. of old tuberculin. The sedimentation rate varied from 60 to 78 mm. per hour. The serologic reactions of the blood were negative. Urinalysis revealed occasional white blood cells and hyaline casts. The serum protein was 6.5 gm. per hundred cubic centimeters with 2.8 gm. of albumin and 3.7 gm. of globulin (albumin-globulin ratio 0.80). Chemical examination of the blood for phosphorus, phosphatase, and calcium was 4.3 mg., 5.6 units, and 11.4 mg., respectively, per hundred centimeters.

Pathologic examination (Capt. George J. Heid). Biopsy specimen from a portion of the left lacrimal gland revealed that much of the glandular tissue was replaced by well-preserved, noncaseating tubercles which were formed by loosely arranged, large epithelioid cells. Most of the tubercles were well demarcated by a very thin fibrous capsule or compressed lacrimal stroma and acini. A few multinucleated giant cells were present in the section. The diagnosis was Boeck's sarcoid. A biopsy specimen from a posterior cervical gland (fig. 4), which was subsequently excised, gave a similar microscopic appearance, though there was evidence of slight necrosis in the central portion of some tubercles.

Course in the hospital. The patient's general condition gradually improved sufficiently with supportive treatment to enable him to become ambulatory. His low-grade fever then completely abated. The chest symptoms were relieved by anti-asthmatic therapy. During the first four months of hospitalization, his weight continued to decline from a previous normal 175 pounds to 131 pounds, despite a high caloric diet supplemented by vitamins. A slow improvement in weight, however, was noted after that period. The enlarged parotid glands returned to normal in three weeks. The swollen lacrimal glands, however, did not completely subside during his five months of hospitalization. His sedimentation rate continued to remain high. The bilateral uveitis remained essentially unchanged, with no improvement of vision. In the fourth month of ocular involvement, superficial punctate keratitis and subepithelial infiltration began to appear in the inferior portions of both corneas, more marked in the left. These changes were associated with superficial scarring of the involved areas. Because of the persistence of ocular activity and generalized weakness, he was transferred to a Veterans' Hospital, November 8, 1944, for further medical care.

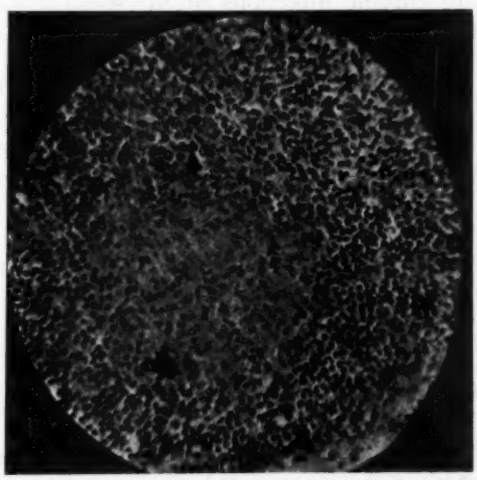

Fig. 4 (Schultz). Photomicrograph (high power) of a section of cervical lymph gland, showing typical "hard" tubercle of Boeck's sarcoid.

Summary and Conclusion

A case of Boeck's sarcoid is reported associated with uveoparotitis and dacryoadenitis. Characteristic involvement of the lungs, lymph glands, and bones is described. The Mantoux reaction was negative in strong dilutions. The serum globulin was increased. Final diagnosis was based upon biopsy specimens taken

from the lacrimal and cervical glands, revealing the typical "hard" tubercle. The general condition of this patient improved with subsidence of the swelling of the lacrimal and parotid glands. The severe uveitis, however, persisted, and a superficial keratitis subsequently manifested itself in each eye.

Chronic uveitis is the most frequent ocular lesion of sarcoidosis and occurs in about 10 percent of these cases.

Boeck's sarcoid should be suspected in all chronic infections of the uveal tract that have usually been considered tuberculous.

This case also tends to corroborate mounting evidence that uveoparotitis (Heerfordt's disease) and Mikulicz's syndrome are frequently manifestations of Boeck's sarcoid.

NOTE: Since this paper was submitted for publication, another case of Boeck's sarcoid with marked enlargement of the lacrimal and parotid glands has been observed by the writer in a colored soldier. There was no involvement of the uveal tract. Study of a biopsy specimen of the lacrimal gland confirmed the diagnosis.

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SEVERE LACERATION OF ONLY EYE WITH RECOVERY OF USEFUL SIGHT

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Asbury Park, New Jersey

The following history illustrates the fact that every effort should be made to try to save what appears to be a completely destroyed eye, particularly when it is the only one.

On the morning of April 12, 1944, a badly shocked and blinded man, aged 52 years, was led into my office by fellow workers.

While leaning from a slippery bank to

open an auto truck door, he had lost his footing and fallen against the upper corner of the open door, striking his right eye, and causing immediate total blindness. The other eye had been enucleated 40 years before, following a gunshot accident.

The patient was immediately examined, and the eyeball was found to be ruptured over the ciliary region. The laceration extended from the 7-o'clock to 12-o'clock position. A large blood clot was removed from the laceration, which contained a considerable portion of prolapsed and lacerated iris as well. The entire globe was collapsed and seemed to contain nothing but clotted blood. In spite of the apparent hopelessness of the situation, the eye was cocainized by applying cocaine flakes at 5-minute intervals for four applications. A careful cleansing of the eye and excision of the prolapsed iris made it possible to obtain an accurate outline of the wound. I was able to place three corneoscleral sutures located at the 9-, 10-, and 11-o'clock positions. A 2-percent atropine ointment together with sulfathiazole ointment was instilled. The patient was transported to the Fitkin Hospital by ambulance where tetanus antitoxin and a hypodermic injection of sodium sulfadiazine were given. After the initial dose of sodium sulfadiazine, the patient was given 5 gm. of sulfadiazine four hours later, by mouth, and 2 gm. every four hours thereafter until April 20th (eight days later), when the dose was gradually diminished. Sulfadiazine therapy was discontinued on May 6th.

Routine check of the Wassermann reaction was found to be 4 plus. The only anti-luetic treatment given while the patient was in the Hospital was the use of potassium iodide solution by mouth. He remained in the Hospital until May 20th, at which time he could distinguish hand motion to the temporal side. Absorption of vitreous hemorrhage was gradual, and by July 6th, or nearly three months after the accident, it could be definitely established that the lens had been extruded at the time of the accident. On August 3d, the fundus could be fairly well visualized and showed no severe lesions. The patient was refracted and given the following correction: O.D. +11.00D. sph. ⊂ +4.50D. cyl. ax. 130° with which he had 20/50 vision.

The case cited above I believe to be unusual and the satisfaction in watching the slow improvement in the eye, together with the improvement in the morale of the patient, was a great source of satisfaction to me.

501 Grand Avenue.

A NEW TYPE OF ENUCLEATION IMPLANT

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Oakland, California

The large percentage of globes extruded after implantation following enucleation or evisceration has led to a constant search for new types of implants. Vitallium spheres, perhaps the latest type, are not in my experience retained in a larger proportion of cases than are the other types.

It occurred to me that an implant in the form of a skeleton or open framework, instead of a continuous surface, might be more successfully retained. A blood clot would form inside of the open framework and become organized into fibrous tissue running in all directions. This would fasten the implant in place. The Guist sphere, which is made from porous animal bone, is based on this concept. It also occurred to me that the new plastic material, acrylic resin or methyl and ethyl methacrylate, which is used so much in dentistry, would be an inex-

pensive, easily worked and readily available substance for making the implant. Berens and Rothbard* have recommended similar materials (Lucite and Plexiglass) and have stressed the fact that they are nonirritating and nonabsorbable.

Fig. 1 (Eggers). Photograph of fenestrated plastic implant.

The acrylic skeleton implant is very light in weight, colorless and translucent in appearance. It weighs slightly less than a continuous glass implant of the same diameter, and less than half as much as a continuous-surface vitallium implant. The framework, which is approximately one-eighth inch in width, separates six large equal-sized openings. It might be better to have only four openings—all equal in size and elliptical in shape, and all running in the same direction from pole to pole. These would furnish grooves for the four recti muscles. The spherical shape need not be used. Berens and Rothbard recommended a quadrilateral and pyramidal form, rounded at one extremity and tapered to a blunt point at the other. Any dental laboratory technician can easily make the implant by following the appended directions.† Sterilization can be accomplished by boiling, autoclaving, or placing the implant in one of the usual sterilizing solutions.

* Berens, C., and Rothbard, S. Synthetic plastic material for implantation into orbit following enucleation. Amer. Jour. Ophth., 1941, v. 24, May, p. 550.

† The following directions should enable any dental laboratory technician to make the implants:

A marble (a child's play marble) of the proper size (14 to 18 mm. in diameter) is used because of its spherical contour and ready availability.

Cover the marble lightly with glycerin or oil, and adapt plate wax over its surface. Cut through the wax around the equator of the sphere, and remove the two hollow wax hemispheres from the underlying marble.

Insert an ordinary flat headed screw, about three quarters of an inch in length, through the pole of one of the wax hemispheres so that about two thirds of the length of the screw will protrude into the cavity of the hemisphere.

Mix dental stone and pour it into each of the wax hemispheres so as completely to fill the hemispheres. Press the two filled hemispheres together and allow the stone to harden. Then remove the wax, leaving a stone sphere with a screw projecting into it for about two thirds of its length.

Adapt tin foil around the stone sphere. A piece about two inches square will suffice. Cut plate wax into strips about one-eighth inch wide. Wind the strips around the sphere so as to produce the desired pattern for the framework of the final implant, no wax, of course, being placed where the openings are to be located.

The stone sphere with its windings of wax strips is invested in plaster in the lower half of a flask. Half of the sphere—the half containing the screw—is buried in the plaster. The plaster is allowed to set. Then the usual separating medium is applied to the surface of the plaster in the lower half of the flask. Plaster is poured into the upper half of the flask and the latter is closed. The plaster again is allowed to set. Then the wax is softened by placing the flask in boiling water for at least 10 minutes. The flask is opened and the wax is removed by thorough rinsing with chloroform and with clean boiling water.

The plastic material is mixed as directed by the manufacturer. It is packed into the spaces formerly occupied by the wax. Curing is done in the usual manner. The screw is pulled out. Stone and foil are dug out through the various openings. Finally, the edges of the plastic implant are trimmed and polished.

Preliminary experience with this new implant has been very favorable. It has not been used sufficiently long, nor in a sufficient number of cases to justify unequivocal recommendation.

Oakland Regional Hospital (14).

NEW TECHNIQUE IN ORBIT RECONSTRUCTION FOLLOWING RADICAL SURGERY

EDWARD D. MCKAY, Major (MC), A.U.S.

A veteran of World War I, aged 54 years, gave a history of having had a pterygium removed from his left eye in 1939. Since that time it had recurred and in the past year had completely obstructed his vision. He was sent to the Brooke General Hospital, Fort Sam Houston, Texas, for diagnosis and treatment.

EXAMINATION. The results of his physical examination, including dental, urologic, ear, nose, and throat consultations, were normal. Blood pressure was 160/90. The only pathologic change or trouble was to be found in the left eye.

Ophthalmologic examination. Vision O.D. was 20/40, correctable to 20/15; O.S. light perception only. Externally the right eye was normal. The cornea of the left eye was covered with thickened, rough epithelium everywhere except at the 6-o'clock position, where there was an area about 3 mm. in diameter of clear cornea. The iris dilated evenly, and reacted to light.

Slitlamp examination revealed normal external structures in the right eye. In the left eye the cornea was covered with epithelium, well vascularized but not inflamed; instead it was somewhat pale. It was rough and irregular and thickened at the limbus nasally and above. That part of the anterior chamber in view below was optically clear.

The *ophthalmoscopic* examination showed a normal right eye. In the left eye, the part of the fundus that could be viewed from below was normal.

Course. A biopsy specimen was taken on August 11, 1944, and reported on August 16th as follows: Squamous-cell type, epidermoid carcinoma. During the interval between taking the specimen and receiving the report X-ray therapy was given to a total of 5,000 r over five daily exposures.

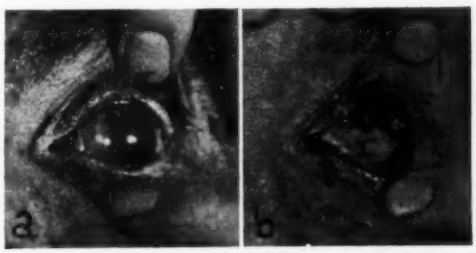

Fig. 1 (McKay). a. Fifth postoperative day. Graft viewed through the glass sphere. b. Fifth postoperative day. Graft in place.

Operation. On August 19th an enucleation of the left eye was performed, which included all the bulbar conjunctiva and that of the cul-de-sac up to the lid conjunctiva. The plastic surgeon, Major Laurence Quill (MC), cut a split-thickness graft from the thigh. At his suggestion I used thrombin and heparinized serum as a glue.* The field was dried completely with hot, wet compresses, then the muscles were tied. This as the bed was painted with the heparinized serum, and the graft was placed over a 24-mm. glass sphere, painted with the thrombin, the glass sphere reversed, and placed in

* Five minims of heparin are mixed with 5 c.c. of the patient's whole blood and centrifuged 10 minutes. The serum is taken off and this heparinized serum is applied to the operative surface. Five thousand units of thrombin, topical, are diluted with 5 c.c. of isotonic saline and applied to the graft (Tidrick, R. T., and Warner, E. D. Fibrin, fixation of skin transplants. Surgery, v. 15, p. 90).

the socket. On the third postoperative day the dressing was removed and the graft could be viewed through the glass sphere; it was in good condition. The patient made an uneventful, comfortable, and prompt recovery. He was discharged from the Hospital, wearing an artificial eye.

OPHTHALMOLOGY IN VENEZUELA

A. PERRET, M.D.

Caracas, Venezuela

The earliest references to the practice of ophthalmology in Venezuela date from the year 1793. Cataractous eyes were operated on by the two methods of couching and extraction, and the official fee set for these procedures by the Colony was 25 pesos, or $20.00 in United States currency, for couching, and 50 pesos, or $40.00, for extraction.

The first teacher of ophthalmology in Venezuela was Dr. Jose Maria Vargas, who, in 1827, after the Independence Wars, was the founder of the first medical school. In addition to other medical subjects he taught ophthalmology, and among his works was a "Treatise on diseases of the eyes." At this time ophthalmology was more advanced than were the other surgical specialities because many general surgeons and internists practiced some form of the art.

In the latter half of the ninteenth century there appeared many noted ophthalmologists, and many written works on the subject. The most important of these were the contributions by Dr. Eliseo Acosta on "Oral lessons on diseases of the eye" and Gibernau y Subira on "Anatomy and diseases of the eyes."

In 1891, Dr. Alberto Coutourier began his work as the first specialist in ophthalmology at the Vargas Hospital of Caracas. This Hospital is mentioned because of its importance as the outstanding medical center of the Republic and its association with the medical school of Caracas.

In 1918 the first teaching clinic of ophthalmology was founded at the School of Medicine, and was known as the "Catedra Libre de Oftalmologia." At its head was placed the internationally famous Jose Espino, a member of the American College of Surgeons, author of 50 scientific papers, and guiding light in the study of ophthalmology in Venezuela.

Venezuela has two medical schools, one in the Central University of Caracas and one in the University of the Andes in Merida. The curriculum covers six years, the third and fourth of which the students spend as externs in the clinical subjects with the didactic work, and the fifth and sixth years as interns with continuation of lectures, clinics, and laboratory assignments.

The professorships are determined by a competitive examination given by a board of specialists in the particular field.

The number of students admitted to each entering class is limited to 150 and is determined by competitive examination. The National Government underwrites the payment of the tuition and laboratory fees of all professional students. There is a national law in Venezuela that all medical students upon graduation must practice for no less than one year in towns with a population of less than 10,000. The purpose of this law is the proper distribution of medical men throughout the interior.

The undergraduate teaching of ophthalmology consisted of the following subjects:

Anatomy and physiology of the eye are studied in conjunction with the other organs during the first two years. During the fifth year, classes in clinical ophthalmology are held by the Professor, and then three

months are spent in the clinics under the guidance of the Chief of the Clinic and his assistants.

Upon graduation all medical students are required to have a diagnostic knowledge of the more common ocular diseases such as trachomas, glaucoma, iritis, and conjunctivitis and to know the surgical procedures of enucleation, and of complete iridectomy for acute primary glaucoma.

The object of this training is to acquaint the physician with the measures necessary in handling the eye diseases found in the outlying communities far away from medical centers.

Those who wish to specialize in ophthalmology after graduation continue their training at the Vargas Hospital. They attend eye clinics there and at the other institutions and are permitted to assist and perform operations. Preceptorships are common in this field.

A Society of Oto-Neuro-Ophthalmology, comprising members from all over the country, meets in Caracas monthly. Admission to the Society is gained by presenting a scientific paper, and membership is maintained by writing at least one paper annually. All of the papers are published in the Journal of the Society called, "Revista de la Sociedad de Oto-Neuro-Oftalmologia Venezolana," which has a circulation throughout Latin America.

Optometrists are permitted to prescribe glasses. The principal optical houses send technicians throughout the interior of the country, making glasses available to all.

The principal centers of ophthalmology are located in Caracas, Maracaibo (the second city in Venezuela), Barquisimeto, and San Cristobal. Ophthalmology and otolaryngology are almost entirely separated.

To mention some of the unusual manifestations of ophthalmologic entities found in Venezuela:

Trachoma is notable for its benign nature, for the rarity of formation of deformities, and the rarity with which it affects the visual acuity.

Conjunctivitis neonatorum is frequent in spite of the mandatory use of the Credé method.

There is an abundance of cases of conjunctivitis due to the Morax-Axenfeld and Koch-Weeks bacilli. The Romagnan syndrome, which consists in a special form of unilateral conjunctivitis with edema of the lids is frequently observed in a tropical condition called Chagas's disease produced by the Schizotrypanum cruzi.

We also see, although more rarely, cases of myiasis, filariasis, cysticercosis, and other parasitic diseases.

Although leprosy does not constitute a menace, its ocular manifestations are seen with moderate frequency in the leprosaria. Syphilis is the most frequent etiologic factor in the inflammatory diseases of the eye.

Pterygia are extremely frequent.

Lacrimal stenosis is also more frequent than in the United States.

Diabetic retinopathy is a rare condition, and hypertensive retinopathy is not common.

An intensive campaign is being carried on by the sanitation authorities for the prevention of blindness, the most frequent causes being syphilis, ophthalmia neonatorum, and glaucoma. There are several institutions for the blind.

Ocular surgery is well advanced. In 1919 the first intracapsular-cataract extraction in Venezuela was performed by Dr. Espino by the Smith method.

In 1937, after Arruga's visit to Venezuela, the intracapsular extraction with forceps was adopted by most of our ophthalmologists. The next year Espino and Mendez did the first phakoeresis of Barraquer, which then became the method

of choice in senile cataract.

In 1940 the keratome and scissors incision with Castroviejo's corneoscleral sutures was substituted for the Graefe incision.

In December of the same year the corneoscleral suture of Barraquer was substituted for Castroviejo's suture. Arruga's capsule forceps is used only after several attempts with the suction cup have failed.

Dacryocystorhinostomy is a common operation in Venezuela. Notable is the recent paper of Dr. Jesus Rhode, who reported his results in 51 surgical cases in which he and Dr. Louis Mendez operated, both prominent and well-known specialists in Latin America.

The technique followed was that of Dupuy-Dutemps, with a large opening of the bony wall, 12 mm. high, 8 or 9 mm. wide, made with an electric trephine in two steps: the first one very close to the lacrimonasal duct, the second above and partly inside the first. The anterior two thirds of the opening are situated in front of the lacrimal crest. Two or three posterior and two or three anterior sutures join the mucous membrane of the nose and that of the sac.

In three cases the epiphora recurred.

For pterygia the methods most frequently used are the simple excision, the McReynolds sutures, and the autoplasties of Terson and Villamizar. Electrocoagulation has not given beneficial results.

The methods of choice in muscle surgery are the reimplantations and resections by means of the Jameson, Lancaster, Landoldt, and Reese techniques.

Surgery for glaucoma as practiced in Venezuela consists of the classic iridectomy to relieve the primary acute form.

For cases of chronic glaucoma the Elliot trephining is the method of choice. Iridotasis and cyclodialysis have not given good results.

For the past three years, square corneal transplants and superficial keratectomy with and without injection of air have been used in corneal surgery.

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SOCIETY PROCEEDINGS

EDITED BY DONALD J. LYLE

NEW YORK SOCIETY FOR CLINICAL OPHTHALMOLOGY

May 1, 1944

DR. SIGMUND A. AGATSTON, *presiding*

BRUCELLOSIS

LT. COMDR. HAROLD J. HARRIS (MC) stated that Brucella infection in man is of common occurrence but uncommonly diagnosed. It gives rise to manifold symptoms and a multiplicity of localizations. Uveitis is of fairly frequent occurrence. Involvement of the external ocular muscles, the cornea, the uveal tract, the retina, and the optic nerve has been reported by numerous observers in the presence of positive blood or spinal-fluid cultures. The agglutination test is negative in a majority of chronic infections and therefore the intradermal test and opsonocytophagic test must be used in all illness of obscure origin. Whenever possible, cultural study should also be undertaken, using the special technique essential for the isolation of Brucella. Proper evaluation of the various laboratory procedures is of paramount importance. Treatment must be highly individualized. The sulfonamides, fever therapy, blood transfusions, antiserum, and vaccine therapy all have their special indications. Brucella abortus vaccine is the treatment of choice in the majority of chronic infections. Disagreement was expressed with the popular concept that brucellosis is a rare disease and that there is no known method of treatment in any event.

CERTAIN PATHOLOGIC, EXPERIMENTAL, AND CLINICAL OBSERVATIONS CONCERNING THE ETIOLOGY AND TREATMENT OF CHRONIC UVEITIS

DR. CONRAD BERENS drew the following conclusions after analysis of his cases: (1) The clinical diagnosis of the etiologic factor in chronic uveitis associated with or unassociated with arthritis is usually presumptive. Comparison of clinical and pathologic diagnoses reported bear out this contention. (2) Bacteriologic and virus studies of the eye, both clinical and experimental, have furnished little exact evidence concerning the causative organisms of chronic uveitis associated with or unassociated with arthritis. (3) The experimental work in animals only indicates that uveal inflammatory lesions and the arthritis can be produced by a number of organisms or bacterial filtrates. (4) At the present time, there are no subjective nor objective tests that can be used definitely to associate a chronic inflammatory eye lesion with a certain infection. (5) Although these studies, so far, are only suggestive of the probable etiology of chronic uveitis, Dr. Berens believes the major part of the problem will finally be solved by the careful correlation of clinical with bacteriologic and virus studies made by groups of specialists whose main interest is in this work. (6) Treatment of chronic recurrent types of uveitis (tuberculosis and syphilis excluded) is disappointing, and although general hygienic treatment and autogenous vaccine seem to lessen the incidence and severity of the attacks, they do not affect a permanent cure. (7) The sulfonamides have been ineffectual in the chronic recurrent types of nonspecific uveitis both in curing the eye condition and in eliminating suspected organisms from foci of infection, especially the sinuses. One exception to this statement has been gonorrheal infection. (8) Penicillin administered intramuscularly has proved to be effective in treating gonorrheal uveal con-

ditions, even those resistent to sulfonamides, and may prove effective in treating uveitis associated with staphylococcal infections. In 20 cases of posterior uveitis, penicillin administered intramuscularly in large doses was ineffectual in curing the lesions. In four patients with anterior uveitis, two seemed to be somewhat benefited by intramuscular injections of penicillin. (9) Repeated aspiration of the anterior chamber and alcohol injections into the ciliary ganglion seem to be beneficial surgical procedures, and iridocorneosclerectomy has an important place if it is difficult to control tension, if synechiae form, or if a cataract is developing.

THE ROLE OF STAPHYLOCOCCI IN EYE INFECTION

LT. COMDR. ALSON E. BRALEY (MC) stated that staphylococci are in contact with the body nearly constantly from infancy to old age. If the bacteria are pathogenic, they may give rise to local inflammation. This, in turn, usually sensitizes the individual to their exotoxins. Staphylococci are primarily saprophytes and grow very well on dead skin and sebaceous material. The margins of the eyelids form a good culture medium for the organisms, which are probably transferred there by the fingers and when the factors are favorable set up a local inflammation. This inflammation at first is usually hordeolum or stye, which tends to be multiple and infect adjacent hair follicles, glands of Zeiss or Moll. The numerous local infections sensitize the patient to the exotoxins formed by the bacteria. When other infections by the bacteria occur, the result is usually an acute blepharitis. The individual in cases of this latter infection becomes sensitive to the toxin. The exotoxin formed by some types of staphylococci produce a conjunctivitis without previous sensitization, but after the individual becomes sensitive to the toxin minute amounts of their powerful exotoxin will produce local inflammation.

The first change in the cornea is a mild superficial punctate keratitis produced by the action of the exotoxin alone. After the individual becomes sensitive to the toxin necrosis occurs in the form of the so-called marginal infiltrates. Vascularization of the cornea usually follows these infiltrates and as healing occurs, scars form. The central portion of the cornea remains clear.

Discussion. Dr. D. Cappetta inquired whether Comdr. Braley had seen any cases of keratitis associated with skin lesions in the absence of lid or conjunctival involvement.

Comdr. Braley saw no reason why boils, as in the case inquired about, which are recurrent, cannot sensitize the cornea.

PENICILLIN THERAPY IN ENDOCARDITIS—DISAPPEARANCE OF EMBOLIC LESIONS IN THE RETINA FOLLOWING ITS USE

DR. WARD J. MACNEAL said that in bacterial endocarditis, embolic hemorrhagic spots in the conjunctiva are of diagnostic and prognostic significance and similar embolic lesions in the ocular fundi are even more ominous symbols of impending disaster in the brain and of early death.

Miss M. F., aged 32 years, had typical mitral endocarditis and consistently positive blood cultures. She had a retinal hemorrhage of the right eye on June 14th, and on July 2d bilateral retinal hemorrhages associated with severe visual disturbance were present. These lesions were again observed four days later. On July 1st she had had a mild stroke with hemiparesis. Visual disturbance was again noted on September 14th. Very minute amounts of penicillin had been used up to this time, but after September 20th the patient received 60,000 units per day for

several weeks. She recovered completely and has no disturbance of vision.

Miss H. S., aged 24 years, had a bacterial endocarditis since April, 1943. She was extremely emaciated, and had a mitral systolic murmur and positive blood cultures. She suffered a series of severe epileptiform convulsions on January 26th, controlled by morphine. On January 27th there was a conjunctival hemorrhage and a central retinal hemorrhage in the fundus of the right eye. Apparently the grave mental state was related to multiple cerebral embolism. Treatment included considerable amounts of penicillin. On February 25th the eyes were normal except for the previous myopia and peripheral myopic chorioretinitis.

Discussion. Dr. Martin Cohen, who had followed the ocular status of these patients during their stay in the hospital, described the various lesions, and presented slides illustrating them. He inquired whether there had been mitral regurgitation, stating that a lesion of the retinal artery is generally due to a stenosis and not regurgitation.

Dr. MacNeal, in closing, replied that one cannot always be certain during life of the exact location and nature of the anatomic alterations in the heart. There was at the apex and over the precordium a presystolic murmur and a very loud systolic murmur, which still persisted. He said he thought there was mitral stenosis and regurgitation.

A STUDY ON THE CHEMOTHERAPY OF VITREOUS INFECTIONS

DR. LUDWIG VON SALLMANN described experimental studies with penicillin in vitreous infections. A single intravitreal injection of 0.2 c.c. of a 25-percent solution of purified sodium penicillin, which secured a bacteriostatic concentration of the drug in the vitreous fluid for more than 24 hours, caused little or no damage to the lens and vitreous, and only localized injury to the retina when the injection was placed near its surface. Such an injection checked staphylococcal infections of the vitreous when the treatment was started within 12 to 13 hours after inoculation. The intravitreal injection of the same amount of a 10-percent solution of sodium sulfacetimide, administered six hours after infection, did not influence the course of the inflammation produced by the same strain of mannitol-positive Staphylococcus aureus.

Discussion. Dr. Karl Meyer discussed the local use of penicillin. In the study presented here the penicillin was processed from surface culture. A second process, that of submerged culture, does not yield as purified a form of penicillin. Until pure penicillin becomes available it might be well to test the material to be used in the inner eye on animals before injecting it into the human eye. It also seems advisable to use for such purposes material of better than 800 Oxford units per milligram.

Dr. Mark Schoenberg considered of importance the fact that Dr. Von Sallmann's work promises to furnish the means of preventing the loss of eyes from infection due to perforating injuries. It would seem to indicate the use of penicillin prophylactically by injection into the vitreous immediately after the entrance of a foreign body or even after a simple perforating injury.

Dr. Martin Cohen pointed out that vitreous infections may not be the primary lesion and asked whether it would be necesary to treat the primary focus to obtain a satisfactory result in such metastatic vitreous infections. He also pointed out that inasmuch as the effect of the penicillin is purely local when injected into the vitreous it would seem to be advisable to treat the organs outside the vitreous.

Dr. Milton Berliner recalled that when he injected inert matter into animals' eyes he found lymphocytic reactions in the ciliary body and thought that this might be worth considering upon injecting penicillin.

Dr. Von Sallmann concluded by pointing out that penicillin failed in combating vitreous infections after a vitreous abscess had developed when suppuration of the anterior segment was far advanced. It therefore must be used prophylactically or early in infections, although in many of his animals severe signs of inflammation were present in the anterior chamber when successful treatment was begun; in several eyes there was an interval of 5 days to 5 weeks after inoculation of the anterior chamber and the first treatment with penicillin. The complete failure of vitreous infections after 24 hours is partly explained by the advanced stage of destruction of the inner membranes about 30 hours after infection. As for local treatment in the presence of systemic infection, the eye was treated directly because of the small amount of penicillin available and because of the urgency of the condition. In performing the injection the penicillin is placed as far from the retina as possible and care should be taken to avoid injury to the lens.

Leon H. Ehrlich,
Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY

May 15, 1944

Dr. Vernon M. Leech, *president*

Clinical meeting

(Presented by the Eye Department, Cook County Hospital)

Atopic eczema with cataracta neurodermatica

Dr. Effie M. Ecklund said that a 25-year-old man had had skin symptoms since the age of 10 years. At that time there was mild pruritis in the axillae, antecubital fossae, and in the popliteal space bilaterally. Weeping areas appeared on scratching, which gradually involved the face, neck, and lumbar region. At the age of 20 years, the gradual spread of the lesions had involved the entire body surface except the palms and soles, and these were covered with lesions by the time he was 23 years old. Generalized adenopathy was noted 5 years ago. At that time skin tests showed dermal allergy to many common foods, to several animal emanations and other inhalants. The family history revealed that the patient's father had asthma, his paternal grandmother and a maternal cousin both had asthma and hayfever.

He was admitted to the dermatologic wards of Cook County Hospital on March 21, 1944, for the fifth time since the inception of the disease. The diagnosis of atopic eczema was made, the skin condition being described as "diffuse and angry erythema of the face, neck, body, and extremities, with oozing from the lesions of the extremities."

The patient was seen in the eye clinic on April 13th, with a history of progressive dimness of vision of the right eye for two months, and haziness of the vision of the left eye for two weeks. The vision in the right eye was limited to light perception with good projection; vision in the left eye was 0.4+3 and J6. The external findings were normal in both eyes. There was complete opacification of the lens of the right eye with irregular masses of white amorphous material throughout the lens substance. There was a posterior cortical saucer-shaped opacity of the lens of the left eye and a few fine, dustlike opacities in the anterior subcapsular region. The fundus of the left eye was normal.

Central chorioretinitis serosa

Dr. Effie M. Ecklund presented a woman, aged 58 years, who was seen for the first time in the eye clinic in October, 1943. The vision was R.E. 1.0—2; L.E. 0.8. There had been no history of illness or injury since that time until March 17, 1944, when she noted marked loss of vision in the left eye. On examination, the vision of the right eye was unchanged, and the vision of the left eye was reduced to perception of hand movements. In the fundus of the left eye a detachment of the entire temporal and inferior sector of the retina was seen, extending to, and folding over the disc. There were numerous linear white streaks over the detached portion and, in the macular area, a yellowish subretinal haze. No retinal tears were seen. The visual field was reduced to a small area in the inferior temporal sector.

Physical findings, laboratory tests, and X-ray findings revealed nothing of significance. Ear, nose, and throat examination was normal. When last seen the vision of the left eye was 1/100, the detachment had flattened, the yellowish discoloration of the retina over the macular area had disappeared, and a shrinking white fibrous mass lay over a small part of the retina, just superior and nasal to the macula, which drew this area into several large folds. Intraocular pressure had remained normal throughout the period of observation.

Rosacea-like tuberculide with keratitis

Dr. Effie M. Ecklund presented a man, aged 40 years, who had noted at the age of 32 years a little redness over the lower part of both cheeks and the chin. This continued, with exacerbations and remissions, until January, 1944, when the skin lesions spread to the malar prominences and a small area of the right side of the forehead; the left side of the forehead became involved in April. About one year after onset of the skin lesions, his eyes became red and painful, with marked photophobia, which persisted. One year ago he noted a white area over the inner part of the pupillary region of the right eye which had remained with little change until this time. The photophobia and redness of the right eye cleared up spontaneously about three months ago.

When seen in the eye clinic on April 3, 1944, the vision was R.E. 0.8, J1; L.E. 0.1, J4. The right eye showed a deep, diffuse, ill-defined corneal opacity, with abundant deep vascularization, within the nasal half, and a smaller, sharply defined opacity of calcareous appearance, just nasal to the pupillary area. The remainder of the anterior segment and the fundus appeared normal.

There was moderate ciliary injection of the left eye and deep corneal opacities and vascularization of the temporal half, similar to those of the right eye, with a fresh yellowish infiltrate at the apex of the triangular deep involvement.

The question at that time was whether this was a rosacea keratitis or an acid-fast involvement of the cornea. In the dermatologic clinic, two biopsy specimens from the affected skin failed to provide sufficient evidence for a differential diagnosis between acne rosacea and a rosacea-like tuberculide. There was, however, a 3+ reaction to intradermal injection of 0.001 mg. of old tuberculin, and the patient had focal reactions consisting of marked aggravation of the ciliary injection of the left eye and exacerbation of the skin symptoms. These persisted for about two days and were followed by marked improvement of ocular and dermal symptoms.

Laboratory studies were normal. The X-ray picture of the chest showed some

evidence of an old infiltrative process involving the left infraclavicular region, indicating a probable old fibroid, acid-fast infection. On the basis of these findings, dermatologic consultants concluded that the skin disease was a rosacea-like tuberculide.

During six weeks of observation, the vision had improved to R.E. 1.0+3, L.E. 0.6. Because of the correlation between the skin and eye symptoms, and because of the effect of the tuberculin on the ocular manifestations, it was believed that the corneal involvement was also of acid-fast origin.

Sphenoid-fissure syndrome due to postdental extraction osteomyelitis

Dr. Wayne Wong presented A. S., a woman, aged 33 years, who stated that she had experienced vague right temporal headaches in October, 1943, following extraction of teeth from the right upper jaw. She went into a severe diabetic acidosis and was admitted to the hospital where, about five days later, she developed right facial palsy and paralytic ptosis of the lid of the right eye. No eye examination was made at this time. There was moderate drainage from the right upper jaw, which was treated as Vincent's infection. Biopsy specimen from this area showed a nonspecific granulation tissue; one culture grew Streptococcus viridans.

When seen in the eye department on December 7, 1943, there was no light perception in the right eye; vision of the left eye was 1.0. There was complete external and internal ophthalmoplegia of the right eye. Fundoscopic examination showed that the disc was partly covered by an irregular white fibrous band, on the nasal border of which were several areas of venous hemorrhage. The posterior pole appeared as a white edematous area, in the center of which was located the "cherry-red" fovea. The arteries were barely visible except near the disc. The veins appeared collapsed; some contained broken columns of blood.

Serologic tests gave negative results. X-ray films of the skull showed clouding of the right orbital region.

Orbital-apex syndrome

Dr. Wayne Wong reported two such cases. *Case 1.* R. B., a 17-year-old girl, was seen in the eye clinic for the first time on March 28, 1944, with a complaint of a left-sided headache and a swollen lid of the left eye of two weeks' duration. The vision was 1.0 in each eye. The right eye was entirely normal. The left eye showed a moderate nontender swelling of the upper lid; the bulbar conjunctiva was pale; ocular movements were normal. On April 3d there appeared to be some involvement of the third and sixth cranial nerves. On April 12th, involvement of the third nerve was almost complete, and the pupil of the left eye was dilated. The bulbar conjunctiva showed slight ciliary injection. The slitlamp revealed a fine, dustlike deposit on the posterior corneal surface. Examination of the fundus showed an optic neuritis and an unusual amount of swelling, with considerable venous engorgement and tortuosity. The vision of the left eye was 0.2 at this time.

On April 18th the vision of the left eye was −15/200 and the papilledema was increased to about 4 to 5 diopters, with marked perimacular edema. There was an exophthalmos of 3 mm. of the left eye, measured with the Hertel exophthalmometer. On April 21st the vision of the left eye was 0.3 and there was a definite recession of the papilledema. The only finding of significance was an unerupted first molar of the left upper jaw, impinging upon the deciduous first molar. This was extracted on April 29th, following which there had been gradual re-

cession of symptoms. The patient had been afebrile during the entire hospital stay. Blood and spinal-fluid Wassermann tests were negative. The vision at the time of the last examination was 0.5 in the left eye. The condition was probably secondary to an aseptic orbital periostitis due to the unerupted first molar.

Case 2. L. L., a woman, aged 53 years, noted for the first time an obstruction of the left nasal passage about 20 years ago. In August, 1941, following an explosive sneezing episode, some polyps were expelled from the left nostril. Examination revealed extensive polyposis of the left vestibule, and these were removed at different occasions. In September, 1941, the left eye became exophthalmic, and the patient complained of excessive tearing, double vision, and a dull left-sided headache. The exophthalmos increased. A biopsy study of tissue from the left maxillary and ethmoidal sinuses showed transitional-cell carcinoma. On December 12, 1941, an extensive resection of the left maxillary and ethmoidal sinuses was performed, leaving a marked anatomic defect. Immediately following this procedure the vision of the left eye began to deteriorate and was finally lost. The patient was under observation for the next 2½ years, and no recurrence of malignancy was found. Further plastic procedures will be attempted upon enucleation of the left eye.

In addition to the foregoing history, this patient had diabetes, hypertension, and positive serologic findings. The syndrome was secondary to the malignancy of the paranasal sinuses.

Bilateral macular holes, superimposed upon senile macular degeneration

Dr. Wayne Wong presented E. S., a woman, aged 65 years, who gave a history of progressive inability to do any close work for the past two years. The external ocular findings were negative. The tension was 15 mm. Hg (Schiøtz) in each eye. The vision was R.E. 0.1, L.E. 0.2, corrected to 0.3 in each eye.

Ophthalmoscopic examination revealed that both disc margins were slightly hazy with a small amount of peripapillary pigmentation. Both macular regions consisted of a red punched-out hole, bordered by a sharply outlined ring, with no pigmentary changes. The process appeared to be more advanced in the right eye. The peripheral fundus was essentially negative. All laboratory tests were negative.

Traumatic macular hole, left eye; hysterical blindness, right eye

Dr. Wayne Wong said that R. K., a man, aged 61 years, was seen in May, 1944, with a history of receiving a blow in the region of the right eye about seven days ago. A few minutes after the injury the vision failed completely. The left eye had been injured by an explosion at the age of 10 years.

The vision was R.E., no light perception; L.E. 0.1. There was a residual ecchymosis of the lid of the right eye and several small patches of subconjunctival hemorrhage of the bulbar conjunctiva. The cornea and anterior chamber were clear. The pupils showed no reaction to light. Examination of the fundus of the right eye showed a normal disc and macula. The essential findings of the left eye consisted of a punched-out macular hole, bordered by a white ring with very little pigmentary change.

The Wassermann test was negative. The peripheral-field studies of the left eye showed a 15-degree central scotoma for red. With the right eye uncovered this central scotoma was absent. This finding suggested an hysterical blindness of the right eye.

TWO CASES OF VOGT-KOYANAGI SYNDROME

DR. CHESTER D. JOHNSON said that the first patient, a Negress, aged 50 years, complained in March, 1943, of blurred vision and redness of both eyes of three weeks' duration. The vision was R.E. 0.5; L.E. 0.2. There was intense ciliary injection of both eyes, with fresh precipitates on the posterior corneal surface, aqueous beam and cells, pigment deposits over the anterior lens capsule, and numerous fine strands of posterior synechiae. The iridocyclitis responded to neosynephrine and atropine. On April 22d she was admitted to the hospital because the intraocular pressure in the left eye suddenly became too high to register. A paracentesis was performed on this eye Several defective teeth were removed. Two injections of 50 million typhoid bacilli were given, and three weeks later the tension was 16.5 mm. Hg (Schiøtz) in each eye. The vision was 0.2.

In September, 1943, the patient noted white lashes and patches of vitiligo on eyelids, shoulders, and chest. The ocular tension remained within normal limits until December 27th, when it increased to R.E. 51 mm., L.E. 56 mm. Hg (Schiøtz). The vision was R.E. 4/200; L.E. ability to see hand movements. Intensive treatment with prostigmine and hyoscine brought the tension down to 18 mm. in each eye temporarily, but an increase to 36 and 31 mm., respectively, occurred after several days. A root iridectomy was performed on the left eye. Histologic examination of the excised piece of iris showed dense nonspecific nodular round-cell infiltration, especially around the sphincter muscle and around the arteries of the papillary portion. The postoperative course was uneventful. There had been no change in the vitiligo following a series of neoarsphenamine injections. Five weeks following operation the tension was R.E. 56 mm., L.E. 26.5 mm. Medical treatment failed to reduce the tension.

When last examined the vision was R.E. 5/200; L.E. 4/200. In the right eye numerous old pigmented precipitates appeared on the posterior corneal surface. The aqueous was clear so far as could be seen through the corneal edema. There was occlusion and seclusion of the pupil. The anterior lens capsule was drawn into numerous folds by shrinkage of the membrane. In the left eye there were also numerous old pigmented precipitates, with pigment proliferation between the pupillary border and the peripheral coloboma, and some pigment dispersion over the pupillary and colobomatous area. Seclusion and occlusion of the pupil, with the anterior lens capsule drawn into numerous folds, was also present.

A root iridectomy in the right eye, and lens extraction in the left eye, were being considered.

DR. CHESTER D. JOHNSON said that the second patient, a Negro, aged 14 years, came to the eye clinic in August, 1942. He had received medical treatment four months previously in St. Louis, because of diminution of vision, red, painful eyes, and extreme photophobia. One month after onset of symptoms his lashes and brows became gray, accompanied by areas of vitiligo.

Using both eyes he saw hand movements at 2 feet, with accurate projection and color perception. There were several depigmented areas about the face, body, and hair, with a few areas of alopecia on the scalp and grayish-white eyebrows and lashes. The eyeballs showed a 2+ mixed injection. Each cornea showed a deep yellowish-white oval opacity involving the lower three fourths, with a peripheral clear rim. The corneal opacities contained numerous deep vessels, and

portions showed a yellowish xanthomatous appearance. The oval opacity was continuous with opaque white material which practically filled the anterior chamber in the lower and middle portion, leaving a very shallow chamber above. The visible iris was atrophic. No red reflex was present in either fundus. The tension was 18 mm. Hg (Schiøtz) in each eye. Audiometric tests were within normal limits. The result of spinal-fluid examination was normal. Mantoux reaction for 1:10,000 O.T. was moderately positive. Complete physical examination, X-ray studies of lungs and sinuses, and hematologic examinations were normal.

On November 13, 1943, an iridectomy was performed but was unsuccessful because of the friability of the iris and later vascularization at the site of surgery, in the right eye. An optical iridectomy on the left eye was being considered.

Chorioretinitis with retinitis proliferans of undetermined origin

Dr. Chester D. Johnson said that since January, 1944, this 13-year-old boy noticed that he was unable to read with his right eye. No other symptoms were noted. There was no associated illness or trauma. The only animal contacts known were cats and dogs.

On examination April 18, 1944, the vision in the right eye was reduced to counting fingers at one foot. The vision of the left eye was 10/10. External ocular findings were normal. The pupils reacted well to light. The media of the right eye were clear; the visible portion of the optic disc was normal. Beginning over the temporal half of the disc was some overlying delicate fibrous tissue, increasing in density toward the macular area, where it condensed into a thick irregularly shaped mass. The top of this fibrous band lay about 4 diopters above the level of the retina. Numerous delicate strands extended into various directions from the main stem. Through shrinkage and contracture, the superior and inferior retinal vessels were dislocated toward the fibrous mass. There was no evidence of retinal periphlebitis.

In the extreme inferior nasal periphery a similar fibrous lesion overlay a large area of choroidal atrophy, with marginal pigmentary proliferation.

Complete physical and laboratory examinations, including X-ray studies of the chest and sinuses, Wassermann and agglutination reactions, and tuberculin skin tests, were negative. Tests for toxoplasmosis had not been performed as yet.

Chronic conjunctivitis caused by cystoid degeneration of the upper canaliculus

Dr. Vernon M. Leech presented a paper on this subject which was published in this Journal (April, 1945).

Discussion. Dr. Harry S. Gradle said that the streptothrix or leptothrix infections of the canaliculus are probably one of the most overlooked conditions. Any unilateral conjunctivitis, even without pus, should make one suspicious of an infection. The presence of streptothrix or leptothrix is probably the irritating factor. Apparently the walls of the canaliculus are not infiltrated by the fungus growth, but the mere mechanical presence and the exotoxins are sufficient to cause irritation of the conjunctiva. This is similar to that caused by molluscum.

Apparently, it is not necesary to split the canaliculus. It is easy to dilate it by simple mechanical pressure and flush out the concretions, which come out as whitish lumps, and only in these lumps can streptothrix be demonstrated. It may not be possible to get rid of all in one sitting. It is advisable to massage well with a glass rod to press them out, followed by irrigation.

Dr. Vernon Leech, in closing, said that the reason he did not hesitate to slit the canaliculus in this case was that there was no connection with the sac. It was a cyst, and there was permanent obstruction.

Robert Von der Heydt.

ROYAL SOCIETY OF MEDICINE

SECTION OF OPHTHALMOLOGY

June 9, 1944

MR. FRANK A. JULER, *president*

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RETINAL LESIONS

MR. MAURICE WHITING presented a girl, aged 15 years, who came to the hospital complaining that the vision in her left eye had been deteriorating during the past two months. Her vision was 6/18 in each eye. In the left eye there was an aggregation of small white spots along the inferior temporal vessels and between the superior and inferior temporal vessels around the macular area. The opinion of one colleague was that it was a retinopathy with a vascular basis; of another that it was probably allied to Coats's disease; and of a third that it was an old vascular lesion. The Wassermann test was negative, and there was no real clue to the cause of the condition.

The white spots disappeared after several weeks and left only a slight patch of degeneration.

Discussion. Mr. Juler asked whether it was a retinal or a choroidal condition.

Mr. Whiting replied that the distribution and the edema associated with retinal vessels suggested that it was primarily retinal.

Mr. Juler considered that it might have been a superficial exudative choroiditis with a secondary edema affecting the retina extensively.

RETINITIS PUNCTATA ALBESCENS

MR. HUMPHREY NEAME presented E. G., a woman, aged 36 years, who was seen at Moorfields Eye Hospital complaining of night blindness. She stated that she had been seen at the age of eight years with this complaint. Her parents were first cousins, but neither of them was affected. She had no knowledge of this defect in any of her grandparents or uncles or aunts, but said that a brother and two sisters were affected. The brother had three sons none of whom had night blindness.

With lenses the vision was R.E. 6/12, L.E. 6/24. The pupils were equal and active and the eyes free from signs of inflammation. The eyes were examined after the pupils were dilated with homatropine and cocaine. The media were clear. Both fundi showed that the discs were of healthy appearance. There were, however, very numerous pale spots, oval or circular in shape, in both fundi. They were most numerous in a band corresponding roughly with the circumference of a semicircle to the temporal side of each macula, extending above and below the disc. Only a few spots were seen at the nasal side. Some of the spots were partly covered by retinal arteries which crossed anterior to them. Peripheral to this area, in the intermediate zone, were numerous small pigment deposits in the form of dots and short rods. In some parts were denser aggregations of pigment spots of similar form. Toward the temporal periphery in the right eye was an oval area where the large choroidal vessels and intervascular choroidal pigment were more clearly seen, as though superficial choroidal atrophy had taken place, with some increase of pigmenta-

tion peripheral to this. There were other smaller ill-defined areas of choroidal pallor, but nowhere any typical indications of a previous choroiditis. The fundi were of slightly albinotic type.

The visual field of the right eye was irregularly contracted. There was no nystagmus, nor were there any stigmata of congenital syphilis, in teeth, nose, frontal bones, nor any history of bone or joint affections. Hearing was good. The Wassermann reaction was negative.

Central retinal lesion

Mrs. V. M. Attenborough said that the patient was seen at Moorfields Eye Hospital in February, 1943. He complained of gradual loss of vision in his left eye. His vision was R.E. 6/6, L.E. 6/18. On examination there was some fine pigmentary disturbance at the macula of the left eye. In June, 1943, the vision of this eye had improved to 6/12. The patient was not seen again until May, 1944, when his vision L.E. had failed to less than 6/60. There were a raised mass on the temporal side of the macula and some pigmentary disturbance and edema of the macula itself. The Wassermann reaction was negative. Examination of the ears, nose, and throat gave negative results. Urinalysis was normal; blood pressure 150/95.

In view of the fact that the patient was only 49 years old, Mrs. Attenborough asked for opinions as to whether the mass was inflammatory, degenerative, or neoplastic in character.

Discussion. Mr. O. Gayer Morgan said that it had a cystic appearance. If there had been some central vision it would have been worth while performing a puncture.

Mr. Humphrey Neame said that it appeared to be of a very pale milky color, definitely bulging, and reminded him of an earlier stage of a case he had observed many years ago in which a swelling at the macula was thought possibly to be an early leuco-sarcoma of the choroid. It did not, however, grow as one expected a sarcoma to grow, and after 18 months some small pale spots were seen in the macular area of the other eye and the vision steadily deteriorated.

Mr. B. C. Goulden said that the appearance in the macular region reminded him of that seen in an eye with very massive retinal exudation.

Macular coloboma

Mr. Victor Purvis presented a 14-year-old girl. It was discovered in a routine examination seven years ago that she had a coloboma of the macula of the left eye. There was a large punched-out, circular hole, 3 discs in diameter, with pigmented, overhanging margin and a slight degree of pigmentation in the floor of the colobomatous area. No retina was to be seen in the coloboma. There were a few large choroidal vessels passing diagonally across the floor. The particular point of interest was the extreme ectasia, which he had never previously seen so marked in a coloboma that was lined by choroidal tissue. The case appeared to fall between the first and second groups of Miss Mann's classification. The characteristic gross visual defect was present, vision being only 6/60, with eccentric fixation. There was no relevant family history, and if one agreed with the intrauterine-inflammation theory of the origin of the condition this coloboma presumably had a choroiditis, as the retinal vessels were forming in the fourth or fifth month. The right eye was normal, vision 6/5.

The end results of operation for detachment of the retina (with a follow-up of 50 successful cases)

Mr. Montague Hine gave a full

analysis of the results of operation in 120 cases of retinal detachment. They were completed by November, 1942, so that sufficient time had elapsed to determine the final result in the 50 successful cases. He pointed out that, after excluding a group of 49 cases from one source, in which there was a high percentage of unfavorable risks (30.6 percent successful) the average figure for success could be taken at practically 50 percent for unselected hospital cases, obtained from many sources. He pointed out the danger of compiling statistics too early, several cases relapsing after periods up to six months, and a smaller number proving satisfactory only after an interval of several months.

THE REMOVAL OF MALIGNANT TUMORS OF THE IRIS

MR. FRANK A. JULER said that tumors of the iris may be pigmented or non-pigmented. It has been well established that the former usually originate in pigmented nevi of the iris. This has been shown by Collins (1926), and cases have been reported by several authors (May, 1930; Neame, 1942; and Black, 1942).

Cases of leucosarcomata are more rare, and have been collected by Duke-Elder and Stallard (1930), but apart from the absence of pigment they do not seem to differ in histology or malignancy from the more usual malignant melanomata. They often show looped vessels on the surface.

A ring sarcoma of the iris has also been described which infiltrates the tissues in preference to the more characteristic nodular formation, and which is likely to have spread beyond the iris structure.

The malignant melanomata of the iris are relatively mild in their degree of malignancy, and several cases of local removal have been reported in this country, while the indications have been discussed by both Neame and Black, who have had successful results.

In 1936 he showed before this Section a patient in which local removal was later undertaken. It was a localized, nearly flat growth of the iris in a man of 70 years, and there was no difficulty in removing it by base iridectomy. The anterior chamber was of average depth, and a sufficient section was easily made with a Graefe knife, while the limitation of the tumor to the pupillary half of the iris relieved anxiety about any incomplete removal from the base. The iris was gripped at the side of the swelling, and the mass extruded easily.

The patient was seen six years later, and no recurrence was present. The visual acuity had previously been 6/6 partly, but failed very slowly, owing to the progress of a lens opacity which had been present before the operation.

He reported the following case: On June 18, 1942, A. R., a man, aged 37 years, gave the history that he had been aware of a brown mark in the iris of his left eye for 20 years, and that it had slowly got larger during the past few years.

The vision was 6/6 in each eye. In the iris of the left eye there was a tumor projecting from the surface sector between the 12- and the 2-o'clock positions. It included the whole width of the iris, overlapping the pupillary margin, and just disappearing from view behind the limbus. Its outline was roughly circular, and although the periphery toward the ciliary region could not be seen, the curve of the circumference suggested that it did not extend beyond the iris proper. Its surface was of a dark-brown color, smooth for the most part, with a few depressions. No blood vessels were visible on the surface. There was no apparent tumor of the posterior surface nor

of the ciliary region. The front of the tumor was separated from the cornea by a thin layer of fluid. The rest of the iris was gray colored, except for a few pigmented spots. The tension was normal, the cornea clear, and the eye free from inflammation.

Of opinions expressed by colleagues at Moorfields, four favored removal by iridectomy, two were for excision.

In devising a method for local removal two factors were important: (1) The proximity of the tumor to the cornea precluded the use of a Graefe knife or a keratome in the affected sector on account of the danger of cutting the swelling. (2) The peripheral limit indicated a removal at least as far as the iris base.

On June 29, 1942, under local anesthesia a sclerocorneal suture was inserted and a flap of conjunctiva dissected to the limbus. With a small keratome an incision was scratched in the sclera radially from the limbus along the 2:30-o'clock meridian over a length of 2.5 mm. This was made obliquely, sloping in an upward direction until the anterior chamber and ciliary body were reached. A Sinclair cyclodialysis separator was introduced along the periphery as far as the 12-o'clock meridian, and was pressed well into the angle. The sclera was then incised by cutting down on the separator with a Beer knife.

To remove the tumor an unsuccessful attempt was made to catch the iris margin with a blunt hook laterally and mesially. By means of iris forceps applied to the outer side, however, the tumor protruded readily and was abscised. Some pigmented tissue in the wound was also removed, and histologically was found to consist of normal ciliary processes. Healing was uneventful.

On July 17, 1944, the visual acuity of the eye that had been operated on was 6/9, improved to 6/6 with −1.50D. cyl. ax. 20°. The eye was quiet, there was a slight subcapsular opacity of the lens opposite the center of the iris coloboma. The tension was normal, and there was no evidence of recurrrence. Examination with the gonioscope revealed normal ciliary processes, and no abnormal pigmentation in the region of Schlemm's canal. With the corneal microscope a slight deposit of pigment on the lens equator at the 1-o'clock position and a small pigmented sphere on the iris at the 4-o'clock position have been noted as unchanged for 18 months.

Histologic report. The preparations, owing to kinking of the specimen and to wartime deficiencies, left much to be desired. The tumor contained well-formed spindle cells with a considerable amount of collagen and some reticulum formation. The cells were spreading into the iris stroma without a definite capsule, and in places were heavily pigmented. No mitotic figures were seen. It was impossible to say whether removal had been complete.

Comment. The described method of removal seemed to offer a good prospect of removing the affected part of the iris to the extreme periphery, and indeed by this method a sector of the ciliary body might also have been ablated, although naturally the suspensory ligament of the lens would sustain partial damage.

It is worth while to collect the indications that point to (1) malignancy of an iris tumor, and (2) to the possibility of removal by iridectomy.

(1) Malignancy is indicated by a history of increasing size, a definite nontranslucent protrusion from the anterior or posterior surface, and the absence of inflammatory signs.

Increase of tension also points to malignancy, and is suggestive of extension to the canal of Schlemm.

Flattening of the pupil and loss of its

mobility may be suggestive, but a notch in the pupil is not definite evidence.

(2) Local removal. Extension may be insidious to the ciliary body, the corneal periphery, or the retina. The gonioscope should be useful in excluding extension around the angle on to the corneal periphery, where some abnormal pigmentation might be seen. For this examination it would be necessary that the tumor did not fill the anterior chamber sufficiently to obscure the view through the gonioscope.

Increase of tension would be a definite contraindication to local removal as also would any evidence of ciliary involvement. It has to be remembered that incomplete removal may produce rapid filling up of the eyeball with growth, as in a case described by Greenwood (1929), in which extension soon involved the eyelids.

The therapeutic application of radium as an alternative or additional measure has to be considered. It is unlikely that the slow-growing spindle cells found in these cases are likely to be radio-sensitive. Doses would have to be severe, and damage to the eye would be likely to accrue. Neame applied it in one of his cases as a treatment after iridectomy. A 5-mg. plaque was applied for one hour on two occasions, and considerable discomfort occurred up to three years later. Stallard (1933), on the other hand, states that intraocular sarcomata are very sensitive, and he reports a good result.

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OPHTHALMOLOGIC TRAINING FOR RETURNING VETERANS

In the July 7th issue of the Journal of the American Medical Association, on page 757, there is an outline of graduate continuation courses in ophthalmology offered for physicians from July 1, 1945, to July 1, 1946. An analysis of these with a discussion of how well they will meet the demands of the returning veterans may prove of interest.

For several months in the early part of 1945, medical officers in the armed services were circularized to determine what kind of postgraduate medical instruction they would like to have upon their release to civilian life. Some 5,000 replies were received. Of these approximately three quarters desired some form of specialized training. Fifty-seven percent wanted courses of six months or longer and 19 percent sought short refresher courses. A division into age groups is further enlightening: Among those who were graduated from medical schools between the years 1920 and 1929—that is, the older group of officers—about half of those who desired training wanted long courses and half wished refresher courses; however, in the group of younger physicians—graduated between 1941 and 1945—more than 4,000 were hoping for courses of more than six months' duration, whereas less than 300 wanted the

short refresher course. The reasons for the difference in aim would obviously seem to be that the older men had neither the time nor the inclination to undertake basic training but merely wished to bring up to date their knowledge of newer procedures and to brush up on the familiar methods that they had not used during their period of war service.

The Department of Ophthalmology of Washington University, has received an increasing number of requests from medical officers for courses after demobilization. In the last few months each week has brought several requests, 41 in all since May. The majority of these officers have not specified the type of course they desired, but have merely expressed a wish for postwar training and a request for information regarding the courses that would be offered. However, of those who have stated the type of instruction wanted, most have indicated the wish for extensive training. In this group should be included those who have asked for interneships. The difficulty of supplying the demand throughout the country is going to be great. A threefold problem confronts ophthalmic centers; namely, provision for interneships, long graduate courses, and short refresher courses.

In an effort to provide interneships, Washington University Hospitals have agreed to increase their internes in all branches by 100 percent. It is recognized that this will increase expenses, will divide the available work, and scarcely allow sufficient material for each house officer's education. Concerning the expense, much will be assumed by the Army under the G.I. Bill of Rights. The service in ophthalmology will be less attractive than in normal times because the available surgical material will be divided.

Presumably other hospitals are preparing to increase the numbers of their internes in like manner, but even with this expansion many of the returning medical officers are going to be disappointed because the demand for interneships will still far exceed the supply.

These men must, therefore, turn to the long basic courses which can provide a partial substitute for interneship, but these should continue to be, as heretofore, merely preliminary to residencies. The greatest disadvantages inherent in these as definitive training is their brevity, the limitation of practical handling of eye patients, and the absence of surgery on human eyes. Animal eyes are obviously only a poor substitute, since their anatomy and physiology are so dissimilar and with these the very important aftercare cannot be taught. However, students in graduate courses will have access to hospital wards, and with adequate "rounds" they can learn to a considerable extent the follow-up on surgical patients.

Turning now to the consideration of postgraduate courses now listed, eight universities or hospitals offer training. In these the length of course varies from 2 days to 12 months, and only three offer courses of more than 1 month. The number of possible registrants is not given, but if the plan is similar to the prewar plan, not more than 50 and probably considerably fewer places are open in courses of 6 months or more. It is feared that this will be entirely inadequate. To help meet the emergency the Washington University Department of Ophthalmology has just decided to renew its eight-months' course this fall and will be able to train 16 students. This course is not included in the published lists cited.

It must be recognized that many hospitals and medical schools are so burdened with their present schedules and depleted staffs that courses that they can offer this year will be limited by these

factors, and that other long courses can be made available only as soon as the members of the hospitals and faculties who will return from service can again help to carry the burden now borne by the older members of their staffs.

The American Academy of Ophthalmology and Otolaryngology has appointed a committee to study this very subject, but as far as the writer is aware, no action has been taken. Studies are also being made by the A.M.A. and by the College of Surgeons. However, thus far, apparently no group has made a serious effort to find out just what each unit could offer and to correlate the efforts to render the aid most effective and to extend these teaching facilities as far as possible. It would seem that it were high time that this should be done, since already a few medical officers are being discharged and the problem will be present in an acute form very shortly. Even as this is being written word comes of the end of the Japanese war, so that the time for delay is past and every medical school and hospital must immediately plan to stretch its facilities to the utmost to provide places for these homecoming physicians who have a right to demand and will demand that they be given opportunities for training.

Lawrence T. Post.

THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

Most of us know of the National Society for the Prevention of Blindness, but its character, scope, purpose, and possibilities may not be sufficiently familiar to many who could be helped by it and who could make use of its facilities.

The origin of the Society can be dated from the appointment of a special Commission by the Governor of New York, in 1907, to investigate the conditions of the blind. Fortunately, the chairman of this Commission was the late Dr. Park Lewis of Buffalo. The report of the Commission fell under the notice of a group of public-spirited men and women and led to the promotion, under the auspices of the Russell Sage Foundation, of a New York State Committee for the Prevention of Blindness, afterwards the National Committee—ultimately renamed the National Society for the Prevention of Blindness.

The Society has no branches, but functions from a central office at 1790 Broadway, New York. It maintains close and helpful relations with state societies for the prevention of blindness, early ones being formed in Illinois, Kentucky, and Maryland. Of later date is the St. Louis Society for the Blind, which has prevention activities as a major part of its objectives. An important function of the National Society is to act as a clearing house for these societies and other interested voluntary and official agencies for the exchange and dissemination of information, and assistance in planning programs directed toward the saving of sight.

The president of the Society is a prominent New York attorney, a member of the firm which has represented the Society since 1918. Among its board of directors, numbering 30, are eminent educators, social workers, and scientists of whom 14 are physicians and 1 a renowned scientist in physiologic optics. A competent staff conducts affairs from headquarters.

One of the early activities of the Society was its campaign to prevent ophthalmia neonatorum. The Society is one of the active agencies responsible for reducing the incidence of blindness from ophthalmia neonatorum in schools for the blind from 28 percent in 1908 to 3.4 percent today.

Another notable activity was its promotion of sight-saving classes, which grew in number from 2 in 1913, to 609 at the beginning of 1945. The Society has participated continuously in the preparation of teachers for such classes.

An active glaucoma program has been carried on under the direction of the Society's committee on glaucoma, of which the late Dr. Mark J. Schoenberg was chairman. This committee was also instrumental in the establishment of a station for the standardization of tonometers, which is now being carried on by a committee of the American Academy of Ophthalmology and Otolaryngology. An important part of the Society's program has been demonstration of the use of medical social workers in eye clinics, and the training of such workers. A notable example of the use of medical social workers has been in glaucoma clinics.

Another aspect of its work has been its campaign for the protection of the eyes in industry, prominently featured in its conferences and programs as well as in its publications, moving pictures, and other educational media.

A Conference on Industrial Ophthalmology was held in May, 1945, in which the Society coöperated with Columbia University in arranging and conducting a program presenting the various facets of the subject to a group of leading medical educators in the United States. Among the subjects discussed were: Eyesight in industry, Illumination, The character of work with reference to vision and refraction, Protective devices, Color vision, The use of color as a visual aid, Welding, Toxic agents in industry, and others. The list of subjects indicates the wide diversity of the problem of safeguarding and utilizing eyesight in industry.

In its industrial program the Society coöperates closely with the Joint Committee on Industrial Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology. It is also privileged to have full coöperation from the United States Public Health Service, the United States Army, the United States Navy, the Federal Security Agency, the United States Maritime Commission, the United States Civil Service Commission, and other governmental and voluntary agencies.

In step with the times, the Society is now concerned with the rehabilitation and reëducation of the visually handicapped (not blind) when the visual defects make such a program advisable.

It may be seen from this brief résumé of some of the major activities of the Society that it is not a case-work agency, but rather seeks to reach the individual by helping, through its facilities and counsel, those organizations that are working directly with the individual. In line with this policy, the Society has frequent opportunity to refer individuals seeking advice and guidance to the proper agency.

Among the publications issued or sponsored by the Society are the 320-page "Eye hazards in industry," by Louis Resnick and the 216-page "Education and health of the partially seeing child," by Winifred Hathaway; a 149-page volume on "Industrial aspects of ophthalmology," as well as the quarterly journal, The Sight-Saving Review, an annual report, and numerous pamphlets used in its educational program.

The Society is in a financially sound condition, thanks to the fact that legacies, donations, and other sources of income have been wisely administered; and while it spends each year more than its income from contributions, the difference is made up from the reserve created from legacies and special gifts. It is not the aim of the Society to amass a large endowment, but

by wise use of its funds to do the most good for the greatest number with the means at its command, and to husband these resources to the end that its good works may continue.

E. C. Ellett.

SOCIEDAD OFTALMOLOGICA HISPANO-AMERICANA

Than Spain, no other country has more conspicuously swung from success and world power to disaster. After soaring to great heights of glory and responsibility in her vast colonial empire, she has been shorn of well-nigh all her former territorial possessions.

Within a few years of the expulsion of the Moors from the Iberian peninsula, Spain's explorers subjugated much of North and most of Central and South America. Her language became the cultural medium of millions of aborigines and of other millions of descendants of those who had migrated to the Americas from countries of Western Europe. Yet in rapid succession these colonies and possessions, following the example of the British settlements along the Atlantic seaboard, made themselves independent of the mother country.

At the height of her greatness, Spain formed a part of one of Europe's most powerful empires. Under the Hapsburgs, who at one time held also Austria, the Low Countries, and most of Italy, Spain was the strongest bulwark of the Catholic Church. Notwithstanding this fact, perhaps the literature of no other country has so abounded in frank criticism, and even ridicule, of its religious personages and institutions. Many of the more important misfortunes of Spain are attributable to the seesaw between republicanism and monarchism and between religious orthodoxy and independent thinking.

Santiago Ramon y Cajal, philosopher as well as scientist, shares with some other writers a disposition to blame a good deal of Spanish decadence during the sixteenth and seventeenth centuries upon the "cruel and unpolitic expulsion of Jews and Moors, and the incomprehensible exemption from contributory charges of the clergy and nobility, in whose hands rested almost all the wealth of Spain. . . ." As additional causes Ramon y Cajal mentions "continuous intrusions into the politics of foreign countries, with which we exhausted our strength and wasted the treasures of America." The same author quotes Cánovas as saying that "there was always, even in the zenith of our power, enormous disproportion between our resources and our enterprises."

The Moors of Spain were leaders in medieval science. In the modern scientific era, including the field of medicine, Spain has not generally played so conspicuous a part as some other European countries. But as regards nervous anatomy and physiology, medicine owes a tremendous debt to Ramon y Cajal and his school, whose researches on the structure of the nervous system of man and vertebrates, and concerning degeneration and regeneration of the nervous system, were revolutionary and far-reaching. Ophthalmologists, especially, base a great part of their knowledge of the optic nerve and of the optic tracts and centers upon Ramon y Cajal's scientific activities.

During and between international upheavals, the national medical organizations of the different countries have played an important part in scientific progress, serving sometimes for announcement and discussion of new discovery and methods, and always for the stimulation of contacts between brilliant minds. Even during wars, human intelligence and the scientific spirit struggle to assert themselves. Thus, from the most

recent of Spanish civil wars came certain contributions to the melancholy science of ocular and other disturbances due to starvation, as it was experienced in besieged Madrid.

The International Congress of Ophthalmology held at Cairo, Egypt, in December, 1937, would have been the natural occasion for a good deal of incidental travel in Spain, especially on the part of travelers from the United States. However, the possibility of such travel was destroyed by the outbreak of the Franco or Falangist revolution against the newly elected Spanish Parliament, to which were attributed extremes of hostile action against the Church and other national institutions. The bitter civil war which followed, and which ended with the supremacy of Generalissimo Franco, had an important repercussion in relation to ophthalmology in Spain.

As previously recorded in this Journal (1944, volume 27, page 86), Spanish ophthalmologists waited for four years before the Falangist government felt it safe to permit them to hold a national reunion. This year will probably see the fifth of such gatherings since the ban was lifted. Fortunately, our Spanish colleagues have been permitted to issue reports of their transactions, in "Archivos de la Sociedad Oftalmologica Hispano-Americana (successor to the "Archivos de Oftalmologica Hispano-Americanos" of pre-civil-war days). It is now forty-two years since the modest beginning of this important organization by a handful of Spanish ophthalmologists, who at first had little more to work with than enthusiasm for the advancement of their science.

In the past quarter of a century, Spanish ophthalmology has made important contributions to the specialty, the names of Arruga, Barraquer, and Márquez being particularly well known outside their own country. Since the end of the Civil War, Arruga and Barraquer have resumed their activities in Barcelona, while Márquez remains for the present in Mexico.

Under the able editorship of M. Márquez, the pre-civil-war "Archivos" was one of the best eye journals of Europe. Fortunately, political troubles and four years of enforced silence have not prevented the creation of an equally admirable new "Archivos," under the editorship and administration of B. Carreras Durán, Director, and M. López Enríquez, Secretary of the Society. The rest of the editorial staff comprises H. Arruga, N. Belmonte Gonzáles, J. Casanovas, A. García Miranda, C. Garrigosa, S. Latorre, G. Leoz Ortín, L. Mier, A. Moréu, and J. Pallarés. Editorial supervision is excellent, the printing good, and the illustrations fairly numerous and usually well reproduced. The literary and scientific quality of the articles compares favorably with that of other leading eye journals of the world.

The bulky bimonthly issue (278 pages) dated September-October, 1944, and received (under the difficult conditions of the war in Europe) about the middle of last April, contains a report on last year's Congress of the Society and over one hundred pages of excellent original articles, including a paper by Arruga on a new diathermy apparatus for treatment of retinal detachment, a paper by Palomar Palomar on Vogt's cyclodiathermy in the treatment of hydrophthalmos, a paper by Belmonte González on ocular tension and retinal circulation during pregnancy, a lengthy and well-illustrated paper by Suárez Villafranca on surgery of the eyelids, and a further Arruga paper dealing with experimental and clinical investigations with penicillin in ophthalmology.

The charming "Impresión" which introduces the official record of the Society's annual transactions is written by G.

Leoz Ortín, of Madrid. It is characterized by literary grace and distinction which are reminiscent of Spain's outstanding position in the world of letters. In addition to the seven scientific sessions held under the presidency of Arruga, there were numerous social activities, rendered more picturesque by the fact that the whole Congress was conducted in the shadow of the Alhambra. Concerning the enchantment and deeper significance of this gem of medieval Moorish architecture, Leoz Ortín rhapsodizes in rather vague terms at the close of his narration. Perhaps intentionally, perhaps unintentionally, his language suggests thoughts that he does not utter. Several centuries ago the Moors, whose civilization had produced many poets, philosophers, and scientists, were expelled from Spain. Some of us may be prompted to reflect as to the events surrounding more recent expulsions in which the modern Moors played a strangely different part. But let us rejoice that, in spite of political upheavals, Spain's ophthalmologists are alert and progressive and are maintaining the best scientific and fraternal traditions of the profession.

W. H. Crisp.

ERRATUM

In the July, 1945 issue of this Journal the title of Dr. Ralph I. Lloyd's paper was erroneously printed "Binocular and red-free ophthalmology" instead of ophthalmoscopy.

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is mentioned only in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy, embryology, and comparative ophthalmology

2

THERAPEUTICS AND OPERATIONS

Filatov, V. P. **Tissue therapy in ophthalmology.** Amer. Rev. Soviet Med., 1944, v. 2, Oct., p. 53.

Excised animal tissues preserved at low temperatures and plant tissues stored in dark places produce and accumulate biogenic tissue stimulators. These are the weapons of the protoplasm in its fight for survival under unfavorable biologic conditions. Such biogenic tissue stimulators are similarly produced during active disease processes, in order that the tissues may survive, and with intensification of the disease the stimulators may be produced in such overwhelming quantity that they even may suppress the disease factor itself. The phenomenon of crisis in infectious diseases may thus be explained. The biogenic stimulators produced or introduced into the body accelerate cellular metabolism, aid in the absorption of scar tissue, stimulate regenerative processes, and increase the physiologic function of an organ. Material for biogenic tissue stimulators may be obtained from human cadavers, living donors, and vegetable plant. The material is removed within ten hours after death and is transferred into a dry sterile bottle and kept at a temperature of 2 to 4 C. for seven days. Skin is taken with its subcutaneous tissue, the latter being removed before transplantation. Cadaver blood is taken from the superior vena cava. The aqueous extract of placenta is very rich in biogenic tissue stimulators. The blood and placenta extracts are fractionally sterilized before they are stored. Cod-liver oil and aloe when preserved for five to six days at a temperature of 2 to 4 C. become rich in biogenic tissue stimulators.

Tissue extracts are injected subconjunctivally or subcutaneously ten to fifteen times at 48-hour intervals. Organ tissues, homologous or from rabbit, sheep, or calf, are implanted subconjunctivally. Favorable results were obtained in a wide variety of diseases; such as ulcerative blepharitis, recurring hordeoli, vernal conjunctivitis,

trachoma, interstitial keratitis of various etiology, herpetic keratitis, tuberculosis of the cornea, uveitis, retinitis pigmentosa, optic-nerve atrophy, and glaucoma. Corneal opacities cleared up, inflammatory processes regressed sharply, and there was a tendency to more rapid recovery. R. Grunfeld.

Ginsburg, M., and Robson, J. M. **The effect of detergent on the penetration of sodium sulfacetamide (albucid soluble) into ocular tissues.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 185-193.

A series of experiments to determine whether the penetration of sulfonamides applied locally to the eye can be increased by a wetting agent is reported. Ten-percent solutions of sodium sulfacetamide were used with duponal, a detergent derived from technical lauryl alcohol in 0.1-percent solutions. Experiments were carried out on living rabbits and on isolated ocular tissues. No significant difference between the results of the experiments in vivo and in vitro were found except that as regards the conjunctiva there was a higher concentration of the drug in the isolated eye. This difference is probably due to the fact that in the living animal appreciable amounts of the drug are taken by the blood passing through the vascular conjunctiva.

There was a great increase in the penetration of sodium sulfacetamide into and through the cornea when used with duponal. Removal of the corneal epithelium caused a great increase in penetration of the sulfonamide. The epithelium acts as a barrier to passage of the drug. Removal of the corneal epithelium did not increase passage of the drug into the cornea. The wetting agent acts by overcoming the epithelial barrier.

It is shown that by use of a detergent it is possible not only to increase the concentration of sodium sulfacetamide in the anterior ocular tissues but also to prolong the period during which effective chemotherapeutic concentration is maintained. The results suggest that a combination of sulfonamide and detergent might be of value in local treatment of infections in the anterior segment of the eyeball. (1 table, 3 diagrams, references.)

Edna M. Reynolds.

Poyales. **The combination eucodal-scopolamine-ephetonine in ophthalmology.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 365-368.

In order to obviate the disadvantage of morphine-scopolamine in preparation for surgery a combination of eucodal-scopolamine-ephetonine is used. Eucodal is dihydroxycodeinone, a derivative of codeine which is more analgesic and less toxic than morphine. To counteract the depression of the respiratory center caused by eucodal-scopolamine, ephedrine or ephetonine, which stimulates the respiratory and cardiovascular centers, is added. No untoward reaction has been noted when this combination of drugs is used. The face appears slightly congested and cyanotic. The blood pressure is at first normal but later may be lowered somewhat. After hypodermic injection, this analgesic effect begins within 15 to 20 minutes. Sleep or semisleep lasts from eight to twelve hours. As the effects wear off there is no excitation.

J. Wesley McKinney.

Poyales. **Short wave in ophthalmology.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 369-373.

The local effects of short wave which are made use of in ophthalmology are production of heat in the tissues, active hyperemia, local anesthesia, and spasmolysis. The best results are obtained in suppurative affections of the ocular adnexa, particularly acute dacryocystitis and lid abscesses. The pain of iridocyclitis is lessened by short wave, as is also that of acute glaucoma. Short wave is excellent for promotion of absorption of retinal and vitreous hemorrhage after the danger of further bleeding has passed. In cases of neuralgia of the first division of the trigeminal the results are discordant. Cases apparently identical may be made better or worse. There are two contraindications to wave therapy. The first is the presence of a tumor which may be activated by the short wave; the second, the presence of metallic foreign bodies which by concentration of the current may produce burns.

J. Wesley McKinney.

3

PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Alvarado, Pedro. **Schematic explanation of apparent movements of immobile objects seen through a lens in movement and vice versa.** Bol. del Hosp. Oft. de Nuestra Señora de la Luz, 1945, v. 3, Jan.-April, pp. 15-18.

The author discusses such apparent movements in regard to different types of lenses. (2 diagrams.)

Burian, H. M., and Ogle, K. N. **Aniseikonia and spatial orientation.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 735-743. (3 figures, references.)

Fink, W. H. **An evaluation of visual-acuity symbols.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 701-711; also Trans. Amer. Ophth. Soc., 1944, v. 42, p. 49. (6 figures, references.)

4

OCULAR MOVEMENTS

Pelayo y Martin del Hierro, Manuel. **Technique and results in one hundred operations for convergent strabismus.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 424-429.

The author uses the resection technique of Blaskovics for the external rectus. Resection of one or both external recti combined with tenotomy of one internal rectus is practiced depending on the degree of the squint.

J. Wesley McKinney.

5

CONJUNCTIVA

Bland, J. O. W. **Spontaneous folliculosis of the conjunctiva in baboons.** Jour. Path. and Bact., 1944, v. 56, July, p. 446.

Six baboons developed spontaneous folliculosis of the conjunctiva. In two of them the follicles were as numerous and as severe as in a trachomatous reaction. The condition seems curable. It is not known whether it is infectious or transmissible. It is not related to trachoma nor transmissible to man. The ease with which these animals are stricken with this disease in Egypt makes them poor subjects for trachoma research. Francis M. Crage.

Höhr Castan, José. **Superficial epidemic keratoconjunctivitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 343-350. (See Section 6, Cornea and sclera.)

Pearson, G. H. **A review of eye disease in Central China.** Brit. Jour.

Ophth., 1945, v. 29, May, pp. 260-268. (See Section 18, Hygiene, sociology, education, and history.)

Somerset, E. J. **Self-inflicted conjunctivitis.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 196-204. (See Section 16, Injuries.)

Staz, L. **A modification and extension of the McReynolds operation for pterygium.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 193-196.

The following modifications in the McReynolds operation for pterygium are suggested: (1) Subconjunctival injection of novocaine and adrenalin into the lower fornix as well as into the site of the pterygium. (2) Prevention of overlapping of the conjunctiva along the upper limbus after implantation of pterygium. (3) Formation of a conjunctival flap to cover the raw scleral area and to lie along the limbus without encroaching on the cornea. In this way is formed a vertical barrier to prevent recurrence of the growth of horizontal vessels on to the cornea. (3 diagrams.) Edna M. Reynolds.

6

CORNEA AND SCLERA

Höhr Castan, José. **Superficial epidemic keratoconjunctivitis.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 343-350.

This article is principally a review of the literature up to 1941, setting forth the experiences of European observers with epidemic keratoconjunctivitis.

J. Wesley McKinney.

Malbrán, Jorge. **Keratoplasty in Groenouw keratitis.** Arch. de Oft. de Buenos Aires, 1943, v. 18, April, p. 191.

The author reports two cases of the granular type of Groenouw corneal dystrophy occurring in two sisters, in whom a perforating keratoplasty following Castroviejo's technique was performed. In one of the cases recovery was uneventful; in the other, localized ectasia at the line of junction of the graft and the cornea developed as a result of increased intraocular pressure, which subsided after a paracentesis. Vision improved from 1/10 to 3/10 in each case. (4 illustrations.)

Plinio Montalván.

7

UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Alger, L. G. **The cause and treatment of poor vision in aniridia.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 730-735. (7 figures, references.)

Casanovas, J. **Significance of vessels in the interlamellar area of the uvea.** Arch. de la Soc. Oft. Hisp-Amer., 1944, v. 4, May-June, pp. 412-418.

The author calls attention to a layer of tissue consisting of fine bundles situated between the retinal-pigment layer and the lamina vitrea. It extends from the ora serrata as far as the equator posteriorly. Several photomicrographs are shown to illustrate the condition. The cases studied seem to show that blood vessels appear in this tissue as a result of inflammatory disease of the uvea. J. Wesley McKinney.

Kautz, F. G., and Schwartz, I. **Intracranial calcium shadows: choroid ossification.** Radiology, v. 43, Nov., p. 486.

The authors' findings bear striking similarities to others in the literature. Usually there is a shrunken eyeball, a large central area of which is occupied

by a well-delineated, fairly regular, ovoid, circular or semicircular, dense though not strictly homogeneous calcium shadow. This occupies the lens region and extends more frequently into the posterior than into the anterior part of the bulb. At times it assumes the shape of a ring. Description of seven cases follows.

Francis M. Crage.

Sugar, H. S. **Glaucoma and essential progressive atrophy of the iris.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 744-748. (1 illustration, references.)

Vidal, F., and Malbrán, J. L. **Studies on the chemical composition of the aqueous humor of the cat.** Arch. de Oft. de Buenos Aires, 1943, v. 18, April, p. 202.

In this article, the first of a series concerning the chemical composition of the aqueous humor of the cat, the authors discuss at length the different theories on the origin and nature of the aqueous humor and finally consider it as a dialysate, in accordance with Donnan's theory. (Bibliography.)

Plinio Montalván.

8

GLAUCOMA AND OCULAR TENSION

Goar, E. L., and Potts, C. R. **Some observations on the treatment of glaucoma.** Texas State Jour. of Med., 1945, v. 40, Feb., p. 535.

The authors emphasize the need for early operation in acute glaucoma. If miotics do not improve the condition within a few hours, iridectomy must be performed. The authors' choice is iridectomia ab externo. Its technique is described in detail. It is recommended also for simple glaucoma, and for subacute glaucoma or the prodromal stage in which the tension stays high and the patient is constantly on the verge of an acute attack. It has the following advantages over the usual filtering operations: The anterior chamber is evacuated slowly, giving the eye time to readjust itself to the lowered pressure. The instrument does not enter the eye and thus the lens is not in danger of becoming injured. The incision is made at the base of the iris. The anterior chamber is reformed within 24 hours, thus hypotony with resulting malnutrition of the lens is avoided. A wick of iris is left in the wound to insure constant drainage. R. Grunfeld.

Guyton, J. S. **Choice of operation in eyes with primary glaucoma and cataracts.** Trans. Amer. Acad. Ophth. and Otolaryng., 1945, 49th mtg., March-April, pp. 216-225.

Forty-four cases of chronic noncongestive, congestive, and acute congestive glaucoma were studied. In noncongestive glaucoma uncontrolled by miotics, anterior fistulizing operations with deferred cataract extractions apparently afford the best results. If controlled by miotics, combined cataract extraction is the operation of choice because intraocular tension is also generally lowered. In chronic congestive glaucoma, an initial combined cataract extraction usually offers as much chance of controlling tension as a previous anterior fistulizing operation with subsequent lens removal. In acute congestive glaucoma preliminary iridectomy with subsequent cataract extraction is the operation of choice if tension is high. If tension is lower, or the lens is greatly swollen, combined cataract extraction is usually indicated, without preliminary glaucoma iridectomy. Cataract incisions made through an anterior fistulizing bleb should have

no bad effect. The cataract incision should be made below the bleb if tension is low, and through the bleb if tension is normal. Charles A. Bahn.

McGarry, H. I. **Results of surgical treatment of acute congestive glaucoma.** Illinois Med. Jour., 1944, v. 86, Nov., p. 269.

From gonioscopic and clinical evidence it is concluded that failure of an iridectomy to control the intraocular pressure in a case of acute congestive glaucoma is in all probability due to the presence of extensive unbreakable peripheral anterior synechiae. Iridectomy, therefore, in contradistinction to iridencleisis and corneoscleral trephining, is only suited for the early stages of acute congestive glaucoma. Both iris inclusions and trephining are successful in a very large percentage of acute congestive glaucomas irrespective of their duration. Small iris incarceration combined with basal iridectomy has become the operation of choice in the hands of the writers.

Theodore M. Shapira.

Moreu, Angel. **Concept of preglaucoma and its diagnosis.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 313-342.

The author makes an exhaustive study of all patients past fifty years of age who complain of vague visual disturbances. A number of diagnostic phenomena associated with the preglaucomatous state are discussed. If the conjunctival vessels near the limbus are observed with the slitlamp after instillation of zinc sulphate or intravenous injection of nicotinic acid, intermittent dilatation of the arteries is seen in the preglaucomatous eye, whereas in the normal eye the dilatation is constant. As this phenomenon exists in the absence of ocular hypertension, it is thought to be a purely circulatory disturbance. Gonioscopy often reveals pigment deposits on the corneoscleral trabeculum. Pupillary reactions tend to be lazy and show rapid dilatation even to weak mydriatrics. Red-free ophthalmoscopy using the carbon arc may reveal minute congestive foci in the choroid which may be made to disappear by the action of vasodilator drugs. The problem of vascular disturbances in the uveal tract in the pathogenesis of glaucoma is discussed in some detail and a number of tests are described to determine the condition of the uveal capillaries. The light threshold is diminished and dark adaptation retarded. The angioscotoma in the preglaucomatous eye presents two notable characteristics. It is smaller than normal in the zone of the arteries and larger in the zone of the veins; and it is very variable. The article has many graphs showing results of the various tests.

J. Wesley McKinney.

Reese, A. B. **Deep-chamber glaucoma due to the formation of a cuticular product in the filtration angle.** Trans. Amer Ophth. Soc., 1944, v. 42, pp. 155-166. (See Amer. Jour. Ophth., 1944, v. 27, Nov., p. 1193.)

Schoenberg, M. J. **A report on the progress of the glaucoma campaign during the past three years.** New York State Jour. Med., 1945, v. 45, April 1, p. 738.

An outline is given of the program conceived in 1942 to publicize the glaucoma problem and to establish clinics for better diagnosis and treatment of glaucoma. Thus far some special clinics have been established. Checking stations for the standardization of tonom-

eters have been established in New York, Chicago, and San Francisco. Exhibits, papers, and radio talks have fostered interest. Further education in the importance of glaucoma is needed for layman, general practitioner, and optometrist. More ophthalmologists must become interested in special glaucoma clinics. Trained professional perimetrists are needed. Medical social services are needed to provide continuous care and supervision of the patients. Funds for research should be made available. The aid of all oculists must be enlisted in the campaign against glaucoma.

Robert N. Shaffer.

Sugar, H. S. **Glaucoma and essential progressive atrophy of the iris.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 744-748. (1 illustration, references.)

Villalpando, E. D. **Functional and degenerative glaucoma. Data for its diagnosis, classification, and treatment.** Bol. del Hosp. Oft. de Ntra. Sra. de la Luz, 1943, v. 2, Jan.-Dec., pp. 59-131.

This is a 73-page article, in Spanish, well written, but in the nature of a general review of the subject, and with emphasis surgically on the use of hemicyclodialysis (see abstract of paper by Enrique Graue, Jr., above). The grooved cyclodialysis spatula of Torres Estrada is illustrated. Five cases treated with hemicyclodialysis are described. (10 illustrations, references.) W. H. Crisp.

9

CRYSTALLINE LENS

Allen, T. D. **Congenital glaucoma and cataract, bilateral; goniotomy and needling.** Trans. Amer. Ophth. Soc., 1944, v. 42, pp. 308-314. (See Amer. Jour. Ophth., 1945, v. 28, April, p. 388.)

Arruga, H. **Details of technique in the operation for cataract as regards instrumentation.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 351-353.

A brief review of the advances made in the past 15 years toward perfecting instruments used in cataract extraction. J. Wesley McKinney.

Basterra, J. **How failures of capsular forceps are lessened. Our second model of capsular forceps.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 354-359.

A capsule forceps the blades of which are inclined toward each other at an angle of 45° gives the most efficient grasp of the lens capsule. By comparing this with other forceps it was found that many more tight capsules could be grasped with the author's model. Thus more intracapsular extractions were possible.

J. Wesley McKinney.

Cañamares Moreno, S. **Intracapsular cataract extraction with the suction apparatus of Arruga.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 360-364.

In 58 cases of cataract extraction the suction apparatus was used. The lens was delivered intact in 56 or 96.5 percent. This high percentage of total extraction was accomplished with loss of vitreous in four cases, hernia of vitreous in six cases, and subluxation of the lens in one case.

J. Wesley McKinney.

Guyton, J. S. **Choice of operation in eyes with primary glaucoma and cataracts.** Trans. Amer. Acad. Ophth. and Otolaryng., 1945, 49th mtg., March-April, pp. 216-225. (See Section 8, Glaucoma and ocular tension.)

Herrmann, H., and Moses, S. G. **The cytochrome oxidase activity of the lens of bovine eyes.** Jour. Biol. Chem., 1945, v. 158, March, p. 47. (See Section 19, Anatomy, embryology, and comparative ophthalmology.)

Mann, I., and Pirie, A. **The effect of ascorbic acid on the occurrence of hyphema after cataract extraction.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 175-179.

To determine the effect of ascorbic acid on the prevention of postoperative hyphema, prophylactic administration of ascorbic acid in cataract extraction was carried out during 1943-1944 and the results were compared with those of the preceding year in the Oxford Eye Hospital.

In 1942-43, 78 cataract extractions showed occurrence of hyphema in 25.6 percent. In 1943-1944, only 39 cataract extractions were done but the percentage of hyphema was 30.7 percent. Saturation of the patient with ascorbic acid was not found to decrease the incidence of hyphema after cataract extraction, all other conditions remaining the same. (2 tables, references.)

Edna M. Reynolds.

Robbins, B. H. **Dinitrophenol cataract in the chick; effect of age.** Jour. Pharm. and Exper. Therapeutics, 1944, v. 82, Nov., p. 301. (See Section 19, Anatomy, embryology, and comparative ophthalmology.)

10

RETINA AND VITREOUS

Bedell, A. J. **Angioid streaks in the deep layers of the retina.** Amer. Jour. Ophth., 1945, v. 28, June, pp. 601-612; also Trans. Amer. Ophth. Soc., 1944, v. 42, p. 288. (13 figures, references.)

Beiras García, Antonio. **Experiments with artificial circulation in the vascular territory of the ophthalmic artery in the cadaver—its possible interest as a method of study.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 419-423.

In four cadavers, after removal of the brain at autopsy, fluid was injected into the ophthalmic artery by means of a canula. The pressure in the artery was regulated to simulate the normal blood pressure. The procedure resulted in restoration of the normal relationship of the intraocular and orbital structures. This method has a practical application in anatomical studies, in teaching, or in experimental ocular surgery. It may possibly have some value in physiologic investigations.

J. Wesley McKinney.

Gözcü, N. I., and Orgen, C. **A case of posterior detachment of the vitreous, accompanied by a hole in the retina.** Göz Klinigi, 1944, v. 2, no. 3, pp. 51-56.

A month after diathermal coagulation for a retinal detachment with a peripheral retinal tear, the patient showed a ring-shaped cloud immediately above the disc, and measuring two disc diameters in diameter. The cloud moved with every movement of the head, and was diagnosed as representing a posterior vitreous detachment with a hole. The retina and its arteries were clearly visible around the openings. (1 photograph.)

W. H. Crisp.

Gutmann, Adolfo. **The pressure of the central retinal artery in allergic disorders.** Arch. de Oft. de Buenos Aires, 1943, v. 18, April, p. 185. (See Amer. Jour. Ophth., 1943, v. 26, p. 783.)

Lee, R. H., Finch, E. M., and

Pounds, G. A. **Periodic fluctuations in the dark-adapted threshold.** Amer. Jour. Physiology, 1945, v. 143, Jan., p. 6.

Periodic fluctuations in dark-adaptation curves, especially near the terminal threshold, have been observed in a number of cases. Binocular tests usually show greater changes in amplitude of fluctuation than monocular or alternate monocular tests. The amplitude and period of fluctuation may vary from day to day but are remarkedly similar when the same subject is tested twice with a half-hour rest period between tests. The magnitude of the fluctuations is sufficient to account for the "frequency-of-seeing" curves obtained when dark adaptation is measured at the terminal threshold by repeated stimuli and the number of correct responses related to brightness of stimulus. R. Grunfeld.

McGregor, I. S. **Macular coloboma with bilateral grouped pigmentation of the retina.** Brit. Jour. Ophth., 1945, v. 29, March, pp. 132-136.

A case of retinal pigmentation unusual in the wide bilateral distribution of pigmentation spots and associated with a macular coloboma in the right eye is reported. The pigmentation spots were arranged in wedges in all four quadrants of each eyeground, following the main retinal vessels. The size and shape of the dots varied from small black dots near the disc to larger, paler, crescentic round or polyhedral patches nearer the periphery. The right eye showed a roughly circular coloboma, much larger than the disc, with a non-pigmented base and a pigmented border. The sclera was not ectatic, and retinal vessels passed smoothly over the surface of the defect.

The literature on central choroiditis of infants is briefly reviewed. It is suggested that a fetal inflammation destroyed the macula and gave rise to the surrounding pigmentary changes, these changes assuming the characteristics of grouped pigmentation with growth at the equator during the last weeks of pregnancy. (2 diagrams, references.) Edna M. Reynolds.

Morgan, M. W., Jr., Mohney, J. B., and Olmsted, J. M. D. **Observations on retinal blood flow with the aid of Kukan's ophthalmodynamometer.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 749-750. (References.)

Nuri Fehmi Ayberk. **Lawrence-Moon-Biedl syndrome in two brothers.** Göz Klinigi, 1944, v. 2, no. 3, pp. 58-61.

In these two brothers, aged seven and eight years, all the symptoms of the syndrome were clearly present (adiposis, genital hypoplasia, retinitis pigmentosa, mental retardation, and polydactyly of feet and hands. The parents and grandparents of the children were first cousins. Wassermann and Kahn tests were negative in the children and in their parents. Radiography showed the sella turcica to be smaller than normal. Examination of the blood showed subnormal hemoglobin, and the author states that most of the cases in the literature show this condition as a constant symptom. (1 photograph.) W. H. Crisp.

Prior Guillem, Antonio. **Syndrome of Terson.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 408-411.

The syndrome consists of a massive vitreous hemorrhage consecutive to subarachnoid hemorrhage. A case is reported, but unfortunately no autopsy was obtained.

J. Wesley McKinney.

Simonson, E., Blankstein, S., and Carey, E. J. **Influence of selected spectral distribution on the glare effect, studied by means of dark adaptation.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 712-724. (5 tables, 4 graphs, references.)

11

OPTIC NERVE AND TOXIC AMBLYOPIAS

Carroll, F. D. **Recurrence of tobacco-alcohol amblyopia.** Amer. Jour. Ophth., 1945, v. 28, June, pp. 636-639. (1 table, fields, references.)

Cerboni, F. C., and Diez, M. A. **Unusual disposition of myelinated fibers.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Feb., p. 97.

A case of myelinated fibers in the fundus of the left eye is reported. The patch of myelinated fibers occupied the posterior pole and encroached upon the borders of the papilla, leaving a funnel-shaped opening through which the emergence of the central retinal vessels could be seen. The literature concerning this condition is briefly discussed. (Illustrations, bibliography.)

Plinio Montalván.

Langdon, J. M., and Mulberger, R. D. **Visual disturbance after ingestion of digitalis.** Amer. Jour. Ophth., 1945, v. 28, June, pp. 639-640.

Loewenstein, Arnold. **Aberrant optic nerve fibers found between retina and hexagonal cells.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 180-185.

Two cases of aberrant fibers of the optic nerve close behind the retina are reported. In the former, the eye showed the presence of a dark tumor of the optic nerve slightly infiltrating the retina at one side. Histologic examination of the eye showed that the subretinal tissue was composed of nerve fibers which could be followed up into the optic nerve, where they turned sharply. The retina over the growth showed only the anterior layers but the retinal structure close to the tumor was completely normal including the neuroepithelium. This case is regarded by the author as one of malignant degeneration of a pigmented nevus of the optic nerve.

The second case of aberrant nerve fibers behind the retina occurred in a hypertensive retinopathy with edematous swelling of the disc. A big "druse" bulged the fibers of the optic nerve over the end of Bruch's membrane and pushed optic-nerve fibers between the retina and the pigmented epithelium. The greater mass of this subretinal tissue was characterized by the presence of huge cytoid bodies. The retina in front of this tissue was well developed.

Optic-nerve fibers aberrant in the orbit have been reported previously, but no other case of aberrant nerve fibers within the eye has been described. (1 fundus photograph, 8 photomicrographs, references.)

Edna M. Reynolds.

Veasey, C. A., Sr. **Concerning the early ocular symptoms of multiple sclerosis.** Amer. Jour. Ophth., 1945, v. 28, June, pp. 640-644.

12

VISUAL TRACTS AND CENTERS

Bender, M. B., and Furlow, L. T. **Phenomenon of visual extinction in homonymous fields, and psychologic principles involved.** Arch. Neurol. and Psych., 1945, v. 53, Jan., p. 29.

Following a gunshot wound in the right occipitoparietal region, a 24-year-

old marine suffered from global aphasia, right hemiplegia, and apparent hemianopsia. Craniotomy was performed and the wound was cleared of fragments of bone. Subsequently the hemiplegia disappeared, spontaneous speech returned, and the hemianopsia receded. But the patient still showed some psychic changes, and he was unable to see in his right homonymous field when an object was simultaneously exposed in his left field of vision, although as soon as the stimulus in the left field was removed he perceived the object on the right. Tested for separately, the object in the right field appeared mostly clear but sometimes blurred and dull, seeming to fluctuate in distinctness.

The authors explain the phenomenon by rivalry, dominance, and attention mechanisms which are normal functions of the cortex. The visuosensory cortexes are in competition with each other and are in equilibrium when at rest. If one cortex is diseased there will be no appreciable decrease in perception of an object held in the pathologic field as long as there are no new or strong stimuli in the normal field of vision. If stimuli are thrown into the intact field, the rivalry mechanism becomes apparent, and furthermore the function of the defective cortex becomes dominated by the normal cortex. Thus the acuity of vision in the affected field is decreased, with dulling and obscuration or even complete extinction of the form, color, and image perceived by the affected field.

R. Grunfeld.

Bender, M. B., and Furlow, L. T. **Visual disturbances produced by bilateral lesions of the occipital lobes with central scotomas.** Arch. Neurol. and Psych., 1945, March, p. 165, v. 53.

A patient whose occipital lobes were extensively damaged from a gunshot wound was at first completely blind. Peripheral vision then appeared and continued to improve, terminating at bilateral 15° central scotomas. During this period the patient showed good perception of movement, defective color vision, and hemeralopia, with the normal psychologic mechanism of filling in of visual-field defects, so as to perceive familiar objects as a whole. Though using peripheral vision entirely he continued to see objects "straight ahead" and could hardly be convinced that central vision was absent. Later his psychologic field of vision became reorganized about a new functional fovea and he was then willing to relinquish his old pattern of vision. Entoptic phenomena with visualization of emanating "waves" and fluctuation of perception in the remaining field of vision were noted. The production of opticomotor nystagmus was possible in the peripheral but not in the central fields of vision. After-imagery could not be obtained in any part of the visual field.

Robert N. Shaffer.

Coverdale, Howard. **Hysteria in ophthalmology.** Brit. Jour. Ophth., 1945, v. 29, March, pp. 120-124.

Ninety-five cases of hysteria with ocular symptoms among 58,927 New Zealand troops are reported. Fifty were considered severe and 45 mild. The average age was thirty years. A high proportion had some pre-existing ocular defect, dating in most cases from childhood. The 45 milder cases were referred back to their units with reassurances. Forty-two of the fifty severe cases were repatriated to New Zealand and eight were regraded to base.

Edna M. Reynolds.

Fonte Barcena, Anselmo. **Visual disturbances in tumors of the temporal lobe.** Anales de la Soc. Mexicana de Oft. etc., 1944, v. 19, Jan.-June, pp.1-16.

Upon the basis of a group of clinical experiences, the author rejects certain views expressed by Cushing and others with regard to the diagnostic significance of symptoms related to tumors of the temporal lobe. According to Fonte Barcena, neoplasms of this region are to be divided into tumors of the anterior half and tumors of the posterior half. Lesions of the anterior half produce asymmetric homonymous hemianopsia (either quadrant or complete), incongruous, and almost always involving macular vision by reason of remote compression of the optic tract; whereas neoplasms of the posterior half produce symmetric homonymous hemianopsia which is congruous, usually partial, and usually sparing macular vision, by virtue of lesion "in situ" of the geniculo-calcarine fasciculus or radiations. (Bibliography.)

W. H. Crisp.

Kravitz, D., and Stockfisch, R. H. **Wernicke's disease (encephalitis hemorrhagica superioris).** Amer. Jour. Ophth., 1945, v. 28, June, pp. 596-600. (References.)

Perlman, H. B., and Case, T. J. **Mechanisms of ocular movement in man: Influence of the vestibular apparatus.** Arch. of Otolaryng., 1944, v. 40, Dec., p. 457.

Movements of the eye may be: (1) voluntary (frontal cortex); (2) reflex optic (occipital cortex activated by a retinal image); (3) reflex vestibular (activated by end organs in the labyrinth). Voluntary movement is made so rapidly that no blurred retinal image is perceived. Ability to hold lateral deviation is dependent on good vision, with cortical and cerebellar tone. Tonic muscle reflexes tend to pull the eyes back toward center. This slow pull produces a blurred retinal image and a stimulus to get the eyes back to the point of original fixation, resulting in nystagmus with the slow component toward the center. In cerebellar disease the reflex neural mechanisms for maintaining deviation are disorganized and the eyes tend to return to the central position. Hence nystagmus tends to be greatest looking toward the side of a cerebellar lesion.

Lesions in the quadrigeminal plate interfere with vertical deviation of the eyes, resulting in inability to raise the eyes above center or inability to maintain them above center, the effect being a vertical nystagmus. Motor fibers that enable the eyes to turn toward an object in the periphery, and that control fusion, convergence, and so on, originate in the occipital cortex. This is also the source of the motor fibers permitting the eye to follow a moving object, so-called optic kinetic nystagmus. In some frontal cortical lesions, the fixation reflex becomes accentuated and the patient can only pull his eyes away from the area of interest by closing them. If there is asymmetry in the neural stimuli from the vestibular systems, the resulting inaccuracy causes blurred retinal images and subjective dizziness.

Most normal demands for movement of the eyes can be accomplished by a subject with no vestibular function. However, stimulation of the vestibular end organs results in slow conjugate deviation away from the center. In the presence of spontaneous vestibular nystagmus, more marked eye movements occur when the eyes are deviated toward the side of the quick component

than when in the direction of the slow component.

Robert N. Shaffer.

13

EYEBALL AND ORBIT

Basterra, J. **The Mules operation.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 374-379.

The advantages stated for the Mules operation are a normal conjunctival sac, better motility of the lids, no sinking of the orbital tissue, and better mobility of the prothesis. The esthetic effect is, therefore, considered better than following simple evisceration or enucleation. J. Wesley McKinney.

Gradle, H. S. **Enucleation versus evisceration.** Trans. Amer. Acad. Ophth. and Otolaryng., 1945, March-April, pp. 225-226.

The three major reasons for removal of an eye are elimination of danger to sight or life, the elimination of pain, and improvement of appearance. Each reason indicates the most suitable type of operation. Simple enucleation, enucleation with implant into the muscle cone, simple evisceration, and evisceration with implant into the scleral capsule each has its indication. From a cosmetic standpoint, they are advised in the following order: (1) Evisceration with implantation of fat, glass, bone, or gold ball into the scleral capsule; (2) simple evisceration without later implant (usually very satisfactory; (3) enucleation with implantation of fat or solid ball into the muscle cone (gives a better cosmetic result than simple enucleation).

Charles A. Bahn.

Hayes, W. M. **Collapse of glass eyes in the orbit.** Amer. Jour. Surg., 1945, v. 67, March, p. 510.

Inside a glass eye a partial vacuum exists, causing the glass eye to collapse at its weakest point, which is the concave posterior portion. If the glass eye breaks while in the orbit, the individual hears the sound of an "explosion," the inrush of air into the cavity of the glass eye. The glass eye is then removed from the orbit with difficulty, for the soft parts are sucked into the cavity of the glass eye. The pieces which are broken off lie always in the cavity of the eye. R. Grunfeld.

Herrmann, H., and Moses, S. G. **Content and state of glutathione in the tissues of the eye.** Jour. Biol. Chem., 1945, v. 158, March, p. 33.

Reduced glutathione is found in various tissues of the eye in the following amounts, stated in mg. per 100 gm. of tissue: lens cortex, 388 to 570; lens nucleus, 64 to 100; corneal epithelium, 78 to 178; corneal stroma, 3.6 to 7.1; retina, 50 to 108; ciliary body, 21 to 39; iris, 14 to 33; aqueous, 0. No oxidized glutathione was detected in tissue extracts, but if extracts of lens nucleus, ciliary body, or iris were reduced with H_2S the amount of reduced glutathione increased 50 to 100 percent.

Corneal epithelium and lens cortex have high reducing capacity, whereas retina, ciliary body, and iris are less active. The reducing system of the cornea consists of a heat-stable and a heat-labile component. The latter contains the enzyme. The heat-stable fraction could be replaced by analogous extracts from other tissues, especially the liver. Glucose and cozymase could not be used to replace the heat-stable factor. R. Grunfeld.

Kirby, D. B. **Enucleation of the eyeball with immediate implantation into Tenon's capsule.** Trans. Amer. Acad.

Ophth. and Otolaryng., 1945, 49th mtg., pp. 229-235.

In uncomplicated cases, evisceration of the eyeball is not considered the operation of choice. Eight to ten c.c. of 2-percent novocaine is used with a minimum of adrenalin. If general anesthesia is employed, 5-percent glucose in normal saline is given hypodermically, intravenously, or by rectoclysis to avoid dehydration. The tendons are cut close to the eyeball and the eye fixed with two small angular bipronged scleral hooks. Severe pressure and hot moist gauze packs are not advised to prevent bleeding, because they delay healing. Tenon's capsule is preferably closed with a suture and the conjunctiva sutured separately with plain catgut. Irregular-shaped implants have no advantage over spheres. If implants are used, portions of Tenon's capsule found in the four oblique positions between the four recti muscles are used for the double overlapping procedure. Two 0000 chromic catgut sutures of the mattress type are used, inserted at right angles to form a cross. Care is advised that the tarso-orbital fascia be not included in the sutures. Three or four mattress sutures are used to close the conjunctival wound horizontally. (8 illustrations.) Charles A. Bahn.

O'Brien, C. S. **Enucleation and substitute operations.** Trans. Amer. Acad. Ophth. and Otolaryng., 1945, March-April, pp. 227-229.

In all types of operation the conjunctiva should be preserved lest the cul-de-sac be shortened. In simple enucleation without implant the recti muscles and Tenon's capsule are brought together by a purse-string suture. Intrascleral implant in properly selected cases affords the best cosmetic result. Hospitalization is longer, postoperative reaction is increased and extrusion of the implant occasionally occurs. After excision of the cornea a small triangular area of sclera is removed from above and below to favor more accurate coaptation of the scleral edges over the implant. Cauterization of the inner surface of the sclera has not been found necessary. An incision around the optic nerve may be made to favor drainage of blood from the intrascleral cavity. Detachment of the nerve from the sclera increases the motion of the sclera. The implant should not be too large or too small and is preferably fat, fascia, bone, glass, or gold. Guist's bone sphere is not advised. Fine white silk sutures are placed vertically and close to the cut margin, to avoid overlapping. The fascia bulbi is sutured horizontally, as is the conjunctiva. If the implant is lost, a delayed implant operation is advised. If an intrascleral implant is contraindicated, an implant into Tenon's capsule is considered the next choice. Delayed implant operations, properly performed in suitable cases, improve the cosmetic result, though motility is usually much limited. Charles A. Bahn.

Pfeiffer, R. L. **Effect of enucleation on the orbit.** Trans. Amer. Acad. Ophth. and Otolaryng., 1945, 49th mtg., pp. 236-237.

Roentgenographic study of 31 patients shows that removal of the eye arrests the growth of the orbit, leads to contraction, and reduces capacity. The earlier in life the eye is removed, the smaller will be the orbit when full growth is attained. This deformation of the orbit is less if an implant is used. Orbital contraction follows enucleation even in adults, the space being taken up by the neighboring sinuses. Facial asymmetry, though not always strik-

ing, follows enucleation in children. (2 roentgenograms.)

Charles A. Bahn.

Puig Solanes, M., Oropeza, J., Garduno, E., and Fonte Barcena, A. **Syndrome of retraction of the eyeball (Duane syndrome).** Anales de la Soc. Mexicana de Oft., etc., 1944, v. 19, Jan.-June, pp. 18-27.

Three cases are reported. (1) A man of 19 years showed enophthalmos and slight narrowing of the right palpebral fissure, with fairly good vision. There was slight convergence of the left eye in the primary position, and upon gazing to the right there was defective abduction of the right eye with increased narrowing of the left palpebral fissure. Upon looking to the left, there was absence of left abduction, with slight right enophthalmos and slight narrowing of the right palpebral fissure. (2) A girl aged five years, retarded as to walking and speaking, was unable to move the right eye to the right; and she further showed left enophthalmos and reduction of the left palpebral fissure upon looking to the right, while upon looking to the left there was left enophthalmos and reduction in the right palpebral fissure. (3) In a man of 19 years, the right eye deviated outward, and had a diminished palpebral fissure and slight enophthalmos. The vision was decidedly subnormal, adduction was absent for either eye, the left eye moved downward and outward when the right eye fixed, the left eye showed narrowing of the palpebral fissure with enophthalmos and elevation of the left eye upon looking to the right, and the right palpebral fissure narrowed, with enophthalmos and downward movement, upon attempting to look to the left. (8 photographs, references.) W. H. Crisp.

Walsh, F. B., and Dandy, W. E., **The pathogenesis of intermittent exophthalmos.** Trans. Amer. Ophth. Soc., 1944, v. 42, pp. 334-354. (See Amer. Jour. Ophth., 1944, v. 27, Dec., p. 1463.)

14

EYELIDS AND LACRIMAL APPARATUS

Paula Xavier, J. de. **Blepharitis and mercurochrome.** Arquivos Brasileiros de Oft., 1944, v. 7, Dec., pp. 323-324.

In the absence of pyoctanine, frequently recommended for the purpose, the author has used with advantage, in a number of cases of blepharitis, the repeated painting of affected portions of the lid margin with mercurochrome solution. The disfigurement caused by the stain may be disguised with tinted lenses. (References.)

W. H. Crisp.

15

TUMORS

Arnau Maorad, Mariano. **Hydatid cyst of the orbit diagnosed sarcoma.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 387-391.

Differentiation of hydatid cyst from sarcoma of the orbit is very difficult, especially in view of the extreme rarity of the former. A case is reported wherein exenteration of the orbit was begun for a supposed sarcoma. Upon finding a large cystic cavity the eye was enucleated and the contents of the cyst with its lining were removed.

J. Wesley McKinney.

Goldsmith, A. J. B. **Secondary carcinoma in the anterior chamber.** Brit. Jour. Ophth., 1945, v. 29, March, p. 136.

Secondary carcinoma was growing in the anterior chamber after the manner of a tissue culture. Beside the

presence of carcinomatous deposits free in the anterior chamber, there were such deposits also in the root of the iris in the ciliary body, in the choroid, and in the sclera. The patient, a woman aged 64 years, had had a radical mastectomy on the left side a year before the onset of ocular symptoms. In the anterior chamber of the enucleated right eye, tumor cells had burst through the iris root and were proliferating into the anterior chamber, where they covered almost the whole anterior surface of the iris in a thick layer having no connection with the iris stroma. Isolated tumor cells were lying on the posterior corneal surface. (4 illustrations, references.)

Edna M. Reynolds.

Walker, J. D. **Recurrent juvenile papilloma of the conjunctiva.** Amer. Jour. Ophth., 1945, v. 28, July, pp. 751-754.

16

INJURIES

Adam, A. L., and Klein, M. **Electrical cataract.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 169-175.

A case is reported in which 11,000 volts of electricity passed through the body by sparking contact with metal-rimmed spectacles. Second and third-degree burns were present around the orbits and other burns were present on the shoulder, neck, and face. Visual symptoms developed six months after the accident. Two years after the accident there were lens opacities in both eyes, mostly vacuoles in the anterior capsule with a scale-like grey opacity on the left anterior capsule. There were also subcapsular gray dots, which were in some places confluent. Vitreous and fundi were normal. General examination was negative except for a moderate increase in blood pressure. Vision without correction was 6/18 in each eye. This was corrected to 6/12 with lenses. The patient was kept under observation for 16 months, during which time the eye condition remained stationary.

The literature regarding cataract due to electric shock is reviewed and discussed. There has been a gradual increase in the number of cases reported during the last eight years. The evidence collected to date is not sufficient to enable us to state the cause of electric cataract or the process by which it develops. (3 slitlamp photographs in color, references.)

Edna M. Reynolds.

Argüello, D. M., and Tosi, B. **Subconjunctival luxation of the lens.** Arch. de Oft. de Buenos Aires, 1943, v. 18, April, p. 179.

The authors report two cases of traumatic rupture of the eyeball with subconjunctival luxation of the lens. In the first case the rupture took place at the 9-o'clock level of the limbus, and the dislocated lens, with some uveal tissue, was situated under the bulbar conjunctiva on the nasal side. One and a half months later, after the rupture had healed, the lens was removed surgically; but ten days after the operation ciliary injection and keratic precipitates appeared in the other eye. The injured eye was enucleated immediately and pathologic examination showed the typical picture of sympathetic ophthalmia. The inflammation in the uninjured eye, however, gradually cleared up. In the second case rupture of the globe took place in the upper portion of the corneoscleral limbus and the dislocated lens was found under the bulbar conjunctiva on the nasal side. Extraction of the lens was done early

in this case; there was a small loss of vitreous at the time of operation, but postoperative recovery was uneventful. The authors emphasize the poor visual prognosis in this type of injury as well as the great danger of sympathetic ophthalmia. (Illustrations, photomicrographs, bibliography.)

Plinio Montalván.

Costenbader, F. D. **Foreign body in the lacrimal sac.** Amer. Jour Ophth., 1945, v. 28, July, pp. 754-756. (4 figures.)

Dean Guelbenzu, D. M. **Double ocular perforation by a foreign body.** Arch. de la Soc. Oft. Hisp.-Amer., 1944, v. 4, May-June, pp. 381-386.

A foreign body perforated the cornea and the root of the iris, and passed into the orbit near the ora serrata. Through the ophthalmoscope, a hole could be seen in the retina, choroid, and sclera. Five months later vision equaled 1.00 with some difficulty. J. Wesley McKinney.

García Nocito, P. F., and Zubillaga, J. B. **Glass splinter in the anterior chamber.** Arch. de Oft. de Buenos Aires, 1943, v. 18, April, p. 195.

In reporting the case of a patient with a glass splinter in the anterior chamber consecutive to the explosion of a chlorine flask, the authors discuss the different surgical procedures for extraction of foreign bodies from the posterior surface of the cornea, the iris, and the angle of the anterior chamber. (5 illustrations, bibliography.)

Plinio Montalván.

Lodge, W. O. **Intraocular foreign bodies.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 205-208.

A method of projection for eyes in which the vision is good but in which the foreign body is too far forward to be seen with the ophthalmoscope is described and illustrated with diagrams. The author recommends that because of the possibility of spontaneous absorption, lens surgery be delayed for a year following removal of a foreign body from the lens. (4 illustrations.)

Edna M. Reynolds.

Neblett, H. C. **Blunt trauma to the eye and orbital wall.** Southern Med. and Surg., 1944, v. 106, Nov., p. 436.

Acute glaucoma occurred in a man aged fifty years, two months after a blunt brow injury. Cure with good vision followed surgery. In a second case delayed changes in vitreous, optic nerve, and macula followed apparent cure of intraocular hemorrhage six months earlier. Four months after an injury considered trivial, a large hole in the macula reduced the vision permanently to hand movements. The last case reported was one of recovery three weeks after secondary glaucoma from a massive intraocular hemorrhage. Francis M. Crage.

Rooks, Roland. **Bactericidal lamp conjunctivitis.** Jour. Iowa State Med. Soc., 1945, v. 35, April, p. 140.

Ultraviolet disinfecting lamps are installed in hospital wards, nurseries, and operating rooms. The danger of direct exposure of the eyes to the lamp rays is well recognized. The author investigated to what extent rays reflected from walls or floor surface became harmful. A tantalum photocell, which clicked once for each exposure of 200 microwatt seconds per square centimeter, was used for measure. One staff member, who previously had suffered three attacks of conjunctivities by direct exposure, exposed himself deliber-

ately, up to the dosage of 15 clicks, to the rays coming from the lamp reflector. That night he suffered from a severe conjunctivitis. Taking 15 clicks as a basis, it was found that, measured at a distance of five feet, the lamp reflector emitted enough rays in 3½ hours to register 15 clicks. When the lamp was placed at a distance of one foot from but facing the wall, and the photocell at a distance of two feet, 15 minutes exposure was necessary for registration of 15 clicks. Under the same conditions a hard-surfaced wall reflected more rays. When the lamp was faced downward at a distance of one foot above a smooth concrete floor, and the photocell was placed 3½ feet above the floor, 3½ hours was needed for registration of 15 clicks. The author recommends directing the rays toward a soft-finished ceiling, and he warns against irradiating the floor in an occupied room. R. Grunfeld.

Skeoch, H. H. **Penetrating war wounds of the eye and orbit.** Brit. Jour. Ophth., 1945, v. 29, March, pp. 113-120.

Early recording of vision is emphasized. Diagnostic trial of a known intraocular foreign body with the giant magnet is deprecated because when negative it means nothing and when positive it means that additional injury has been done to an already damaged eye. Routine radiologic examination is recommended even if a foreign body can be seen within the eye. The equatorial-ring method of X-ray localization is recommended as routine and is described in detail.

Removal of foreign bodies by the posterior route is most often employed, because it permits use of the small electromagnet and affords the most direct line for removal. Substitution of the hand electromagnet for the giant magnet is strongly urged. The one objection is the fact that an incision through the retina is required unless extraction of the foreign body can be accomplished through the scleral wound of entry. Diathermy of the scleral surface before making the incision is said to minimize the possibility of retinal detachment.

In three hundred cases of probable intraocular foreign body, 50 percent had negative X-ray films and 50 percent positive. Of the 150 positive cases, 50 had successful operations for removal of the foreign bodies. Nonmagnetic foreign bodies caused loss of many eyes. Infection was negligible and no cases of sympathetic ophthalmia were seen. (11 illustrations.)

Edna M. Reynolds.

Somerset, E. J. **Self-inflicted conjunctivitis.** Brit. Jour. Ophth., 1945, v. 29, April, pp. 196-204.

Two cases of self-inflicted conjunctivitis are reported, and the clinical signs of 31 cases are reviewed. The outstanding points in the diagnosis are summarized as follows: (1) edema of lower half of conjunctival membrane contrasting with normal appearance of upper half of conjunctiva; (2) scanty discharge associated with a necrotic sloughing area of conjunctiva; (3) excessive epiphora; (4) rapid healing. Treatment consists of cleansing with normal saline once or twice a day and the use of a bland ointment to prevent symblepharon. (5 illustrations, references.) Edna M. Reynolds.

Thornell, W. C., and Williams, H. L. **Foreign body involving the floor of the orbit and the antrum.** Arch. of Otolaryng., 1944, v. 39, Jan., p. 83.

A girl fell on a small branch which pierced the skin and penetrated

through the floor of the orbit into the antrum. A portion of the foreign body was removed. But there remained a fistulous tract which subsequently had to be reopened and at this time more wood was removed. The case is presented because it illustrates the principle that persistence of a draining fistula following apparent removal of a foreign body is highly indicative that a portion of the foreign material is still present in the region.

Robert N. Shaffer.

Torres Estrada, A. **Extraction of intraocular magnetic foreign bodies by means of the small electromagnet.** Bol. de Hosp. Oft. de Nuestra Señora de la Luz, 1945, v. 3, Jan.-April, pp. 21-26.

It is surprising to find that the author considers a radiologic examination of very slight value, not only for localization of an intraocular foreign body, but also for affirmation of its existence in spite of evidence obtained from examination of the eye. Another surprise is produced by the author's recommendation of the old practice of approaching the magnet to the eyeball in order to discover whether the sensation of pain indicates the presence of a magnetic foreign body within the eye.

W. H. Crisp.

Torres Estrada, Antonio. **Ocular lesions caused by emetine.** Bol. del Hosp. Oft. de Ntra. Sra. de la Luz, 1944, v. 2, Jan.-June, pp. 145-155.

The author has seen several cases of ocular injury by this drug. The first two patients had bathed in water containing chlorine. They went to the druggist for an adrenalin solution to relieve the conjunctival hyperemia which had developed from the chlorine, and by mistake were given ampoules containing hydrochloride of emetine. The severe irritation which resulted from this mistake was promptly relieved by atropine. In another case the disturbance was caused by a slight spray of the drug from a hypodermic syringe which was being used for injection. In each case the symptoms were slow to develop and there was no conjunctival discharge but much photophobia. After experiments on dogs microscopic study showed thickening of the corneal epithelium, particularly at the limbus; abundant lymphocytic infiltration between the layers of the cornea, as well as in the iris and ciliary body; and abundant formation of vessels in the deep layers of the cornea.

W. H. Crisp.

17

SYSTEMIC DISEASES AND PARASITES

Alagna, C. **Experimental studies on relations between the Sanarelli-Schwartzman phenomenon in general and as regards the eye and its adnexa.** Giornale di Med., 1944, v. 1, Nov., pp. 163-165.

The author refers to a previous work (Settimana Medica, 1942, no. 46, p. 1037) in which, upon the basis of animal experimentation, he concluded that toxic substances originating in an inflammatory focus remote from the eye, and reaching the eye by circulatory channels, might occasionally sensitize certain ocular tissues and produce a special vulnerability, so that under the influence of renewed introduction of the same toxic substance or even of other toxic substances hemorrhagic reactions might develop.

W. H. Crisp.

Dysart, B. R. **Modern view of neuralgia referable to Meckel's ganglion.**

Arch. of Otolaryng., 1944, v. 40, July, p. 29.

The pain of ulcer of the cornea and in many cases of atypical headache and neuralgia may be relieved by cocainization of Meckel's ganglion. In some cases the progress of corneal ulcers or other inflammatory corneal lesions is favorably influenced by the same procedure. Cases are cited and the technique of cocainization outlined. It is thought that the favorable influence is obtained by intercepting nerve impulses and not by attacking a pathologic process in the ganglion.

Robert N. Shaffer.

Gomes, Pereira. **Focal infection in ophthalmology.** Arquivos Brasileiros de Oftalmologia, 1944, v. 7, Dec., pp. 201-208.

The author still regards it as good practice to refuse undertaking an intraocular operation until possible foci of infection have been dealt with. He repeats accounts of examples of focal infection published by himself in previous years. He has found abscesses at the apices of the teeth more frequent when nerves had been destroyed by chemical agents and not by extraction, and is glad to say that the latter process is more usual in Brazil. Other foci of infection must not be overlooked. W. H. Crisp.

Neame, Humphrey. **Observations upon scleritis, keratitis, iritis, and cyclitis in herpes zoster ophthalmicus, with reports of 23 cases and results of histological examinations in two cases.** Trans. Ophth. Soc. United Kingdom, 1943, v. 63, pp. 239-294.

Of the 23 cases 10 showed macules of the cornea, 2 diffuse keratitis, 3 a disciform type of keratitis, 3 corneal ulcers, 3 superficial punctate keratitis, 5 neuroparalytic changes, 8 scleritis, 8 iritis, and 9 cyclitis. Histopathologic study of two eyes of the series showed round-cell infiltration under the conjunctiva, new fibrous tissue under the irregular epithelium of the cornea, and vascularization of the stroma. In some of the slides nodules of lymphocytes around epithelioid cells were found in the cornea and sclera.

Treatment is unsatisfactory. But ten patient were each given 300 to 450 c.c. of immune serum from a convalescent patient whose attack of herpes zoster had started not more than 18 months previously. The final vision was good in all but one case. Favorable reference is made to Gifford's use of pituitrin for severe pain. For intractable neuralgia, surgical interference and alcohol injections were alike disappointing. The author advises that any patient in whom corneal sensation is reduced or absent be kept under periodic observation, and a contact lens fitted as an alternative to the operation of tarsorrhaphy. (1 table, 30 figures, references.) Beulah Cushman.

Nettel, Roberto, Jr. **Onchocercosis; biopsy and its clinical interpretation.** Bol. del Hosp. Oft. de Nuestra Señora de la Luz, 1945, v. 3, Jan.-April, pp. 1-9. (Reprinted from "Medicina," v. 24, year 25, no. 463.) See abstract from same author below.

This article, whose author practices in the State of Chiapas, in the narrow zone of Mexico affected by this disease, deals with the diagnostic study of the microfilarial organism by means of biopsy either of the superficial layers of the skin or of the whole thickness of the skin. Superficial biopsy consists in taking between the thumb and index finger a fold of the previously disinfected skin, and then cutting a thin

layer of some 3 mm. diameter, parallel to the cutaneous surface. The fragment of skin is placed in a drop of physiologic salt solution, on an object glass, and is examined under the low power of the microscope. The section should not be limited to the horny layer of the skin. The microfilarias tend to accumulate in the papillae, although they are sometimes to be found in the stratum granulósum. Some of the microfilarias pass from the fragment of skin into the fluid, others may be seen by transmitted light to lie beneath and some partly adherent to the tissue. It is sometimes advisable to break up the piece of skin with needles and wait some minutes to find the microfilarias. (6 figures, references.)

W. H. Crisp.

Nettel, Roberto, Jr. **Onchocercosis: paths of invasion of the eye.** Bol. del Hosp. Oft. de Nuestra Señora de la Luz, 1945, v. 3, Jan.-April, pp. 10-14. (Reprinted from "Medicina," v. 23, year 24.) See abstract from same author above.

The author belongs to the Organization against Onchocercosis of the Department of Public Health of Mexico. The principal and most frequent route by which microfilarias reach the eye is through the skin of the lids by way of the palpebral conjunctiva. New generations of the organism are developed usually about every two months. Other organisms probably reach the region of the eye by way of filarial nodules deeply situated at the base of the skull. (3 figures.) W. H. Crisp.

Roveda, J. M. **Ocular myiasis.** Arch. de Oft. de Buenos Aires, 1943, v. 18, Feb., p. 80.

Ocular myiasis is of frequent occurrence in the northern provinces of Argentina, the largest percentage of the cases being found in young children. The lids become considerably swollen and only upon careful examination can the opening through which the parasite penetrates into the subcutaneous tissue be found. It appears as a round punched-out hole varying from 1 to 2 mm. in size. The parasite, about 15 mm. long, is the larva of the fly Dermatobia Cyaniventris. In some cases the larva digs its way into the deep orbital tissues, where secondary infection may give rise to extensive suppuration and ultimate loss of the eyeball. The evolutionary cycle of the parasite is interesting in that the eggs are deposited by the adult fly on the abdominal surface of flies of a different genus, particularly the Neivamyia lutzi, which hatch the eggs and become the carriers of the larvae. These drop on the skin or mucous membranes of person of low hygienic habits, and penetrating through a skin pore or mucous membrane quickly lodge in the subcutaneous tissue. Here they occupy a cavity which increases in size with the growth of the parasite, and produce considerable inflammatory reaction in the surrounding tissues. After extraction of the parasite with forceps the inflammation subsides rapidly. Prophylaxis is based on measures of personal hygiene. (Illustrations, bibliography.) Plinio Montalván.

Sánchez Mosquera, M., and García Márquez, E. **A frequent and little-known syndrome.** Arch. de la Soc. Oft. Hisp-Amer., 1944, v. 4, May-June, pp. 398-407.

The author describes a syndrome of frontal and occipital headache usually experienced on arising in the morning and often associated with lacrimation and photophobia. The angioscotoma is

enlarged. The condition is invariably due to nasal pathology.

J. Wesley McKinney.

Schneider, R. W., Lewis, L., Moses, J., and McCullagh, E. P. **Retinal hemorrhage and lens changes in alloxan diabetes in rabbits.** Jour. Lab. and Clin. Med., 1945, v. 30, April, p. 364. (See Section 19, Anatomy, embryology, and comparative ophthalmology.)

Scott, J. G. **Onchocerciasis.** Amer. Jour. Ophth., 1945, v. 28, June, pp. 624-635. (Bibliography.)

Torres Estrada, Antonio. **Pathogenesis of punctate keratitis of onchocercosis.** Bol. del Hosp. Oft. de Ntra. Sra. de la Luz, 1944, v. 2, Jan.-June, pp. 135-145.

The author discusses especially the peculiar condition which may exist in apparently healthy eyes of persons infected with the microfilarias. These organisms may exist in enormous numbers in the various ocular tissues, and very fine lesions may be made out by careful examination with the ophthalmoscope and strong plus lenses, or with the corneal microscope. These lesions furnish a satisfactory explanation of the photophobia and ocular irritability experienced by such patients. Corresponding to these minute lesions, the iris is found to be slightly atrophied, and a peripheral atrophy is found in the pigment epithelium of the retina and choroid. The vitreous also may present a slight dust-like exudate. In the cornea is found the earliest and most constant of the ocular manifestations of the disease, consisting of the development of a punctate keratitis. A remarkable fact is that, as the lesions of the disease pass from the microscopic to the macroscopic phase, the microfilarias gradually diminish in number, and when blindness has developed it is extremely difficult to find even a few parasites in microscopic section. (One illustration.)

W. H. Crisp.

Torres Estrada, Antonio. **Tuberculous origin of some general disorders of doubtful etiology, particularly some eye conditions. Their treatment with very dilute solutions of tuberculin and methylic antigen.** Bol. del Hosp. Oft. de Ntra. Sra de la Luz, 1944, v. 2, July-Dec., pp. 163-206.

The author calls attention to the striking contrast between the earlier belief in the tuberculous origin of a number of conditions broadly referred to as scrofulous and the later refusal to accept this belief. In the later epoch, it became customary to discard from the picture of tuberculosis all disorders in which the Koch bacillus was not found. The pendulum is now swinging to some extent again in the other direction. In the large clinic of the Hospital de Nuestra Señora de la Luz, at Mexico City, extensive use of the Bezredka test, together with the data of blood biometry, has suggested a greater frequency of the tuberculous than of the syphilitic basis.

Torres Estrada further regards as of considerable value what his essay calls the Vitón method. This consists in administering to patients thought to carry a tuberculous infection one or more injections of infinitesimal doses of tuberculin. If the injection does not cause fever but is followed by improvement in the local lesion and the general condition, with increase of weight, euphoria, and improvement in appetite and sleep, one has a positive Vitón reaction. Torres Estrada, using this

method, found that even the administration of a one-hundred-thousandth of a milligram of tuberculin frequently elicited the Koch reaction, and led to aggravation of the ocular disturbance, whereas in the presence of a positive Vitón reaction the improvement in the disorder was so great and so rapid, and the results at times so nearly miraculous, that they suggested continuation of the use of dilute solutions of tuberculin as specific treatment of the disorder. For a while Torres Estrada reduced the strength of the tuberculin solution to one millionth, and later to the inconceivable quantity of a billionth of a milligram. Even with these extremely weak solutions he has occasionally seen positive Koch reactions. More recently he has arrived at the fantastic dosage of a thousand-billionth of a milligram. By this technique he claims to have cured a tuberculous keratitis, cases of allergic asthma, and allergic skin disturbances. The dose is given every four days. (Many illustrations, tables, graphs.)

W. H. Crisp.

18

HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Berens, Conrad. **The making of an ophthalmologist.** Trans. Sec. on Ophth., Amer. Med. Assoc., 1944, 94th mtg., pp. 17-25. (See Amer. Jour. Ophth., 1945, v. 28, July, p. 809.)

Bowman, D. L. **Carol's first three years (teaching a deaf-blind child).** Outlook for the Blind, 1945, v. 39, April, p. 91.

A description of the efforts and sacrifices made by a mother to teach her deaf-blind child during the first three years of its life.

R. Grunfeld.

Caiado de Castro, Plinio. **Cost of a campaign of prophylaxis.** Arquivos Brasileiros de Oft., 1944, v. 7, Dec., pp. 208-212.

The author analyzes the cost in Brazil of a government campaign against trachoma, with special dispensaries, nurses, and physicians. He arrives at the conclusion that the cost is out of proportion to the results obtained.

W. H. Crisp.

Chance, Burton. **Johannes Müller.** Trans. Amer. Ophth. Soc., 1944, v. 42, pp. 230-242. (See Amer. Jour. Ophth., 1945, v. 28, May, p. 574.)

Clark, Ivor. **Vision problems of military students with heavy academic loads.** Jour. Lancet, 1945, v. 65, Jan., p. 23.

The eyes of 182 students of Ohio University were studied by the author. The average age was 21 years. All were examined under homatropine cycloplegia, 126 needed help, 90 had myopia. A number of cases with certain predominant symptoms, such as headache, blur, and burning, are discussed briefly and separately. There were four cases of progressive myopia, three with shallow chambers (the type which in later life develops glaucoma). Eight who had never had glasses were badly in need of them. The author feels that cycloplegia should be used for all students entering university life. Francis M. Crage.

Fortner, E. N. **Oregon State supervisory program for the visually handicapped.** Outlook for the Blind, 1945, v. 39, Jan., p. 1.

The state of Oregon has only one state school for the blind and two sight-saving classes in the metropolitan center. Last year a successful

experiment was carried out to help visually handicapped children unable to enroll in these classes. The children attend classes in regular schools. They are given sight-saving materials or books in Braille, as the case may be; also "Talking Book" machine and typewriter; and the state pays a fellow student to read aloud lessons that are not available on Talking-Book records. Students who can't get along under this arrangement are placed in the school for the blind or in sight-saving classes. The State Supervisor supervises their education, visits the schools, and advises teachers concerning special teaching problems. R. Grunfeld.

Fries, E. B. **Piano tuning pays dividends.** Outlook for the Blind, 1945, v. 39, April, p. 101.

Piano tuning is a lucrative profession suitable to the blind. The advent of radio has intensified the appreciation of music and has stimulated piano playing. R. Grunfeld.

Graue, Enrique, Jr. **Biographic sketch of Rafael Silva.** Bol. del Hosp. Oft. de Ntra. Sra. de la Luz, 1944, v. 2, Jan.-June, pp. 157-160.

The writer speaks from personal knowledge of his recently deceased teacher, prominent ophthalmologist of Mexico City. After graduating in Mexico, Silva studied in Europe under de Lapersonne, Landolt, and Galezowski. He was then accepted as a pupil by Ernst Fuchs, who, however, made him study German for four months before entering the Viennese clinic. (Portrait.) W. H. Crisp.

Pearson, G. H. **A review of eye disease in central China.** Brit. Jour. Ophth., 1945, v. 29, May, pp. 260-268.

The great bulk of the eye cases seen at the Methodist Hospital in Shaoyang, Hunan, are of conjunctival infections and their sequelae. Acute conjunctivitis, locally known as "fire eye," in which a bright red color of the scleroconjunctival area is associated with soreness and stickiness of the lids, is very common. It is infectious and large-scale epidemics occur.

Trachoma is one of China's most pressing public-health problems. Every fourth person is infected. The author suspects every case of chronic conjunctivitis of being trachoma. Six different types of trachoma are listed and described: (1) early cases in which there is only rudimentary follicle formation and no pannus; (2) fully developed trachoma with many soft lymphoid follicles and well-developed pannus; (3) cicatricial cases where the follicles have mostly disappeared and where scar tissue takes their place (at this stage, pannus frequently covers the entire cornea); (4) "the hard type of trachoma" where the fibrous tissue instead of being smooth takes on a hard, nodular condition, resembling a tesselated pavement; (5) cases with plasmoma formation, in which a friable tumor mass lies below the epithelium of the conjunctiva (not encapsulated, can be scraped out with a sharp spoon but often with serious scarring and loss of conjunctiva); (6) pterygium as a late complication of trachoma.

Expression of the follicles is usually done in the out-patient department with the finger nails or two ordinary scalpel handles. Anesthesia is hardly ever used. The author considers the use of sulfanilamide by mouth irrational. He uses sulfanilamide powder locally. In the "hard type cases" any treatment except excision of the whole area is useless. Entropion is treated

almost uniformly by the Hotz operation.

Pterygium almost universally occurs in old chronic trachoma patients. Its development often begins as a marginal ulcer which progresses toward the center of the cornea.

Gonorrheal infection is very common and ophthalmia neonatorum extremely prevalent. Measles is very common and is often followed by massive ulceration of the cornea and by keratomalacia. Smallpox pustules on the cornea are frequently seen. Acute cerebrospinal meningitis is frequent and is a common cause of blindness. Sympathetic ophthalmia is frequent because of neglected perforating wounds of the eye.

Edna M. Reynolds.

Pollock, W. B. I. **The antiquity of ophthalmology.** Brit. Jour. Ophth., 1945, v. 29, May, pp. 252-259.

Ophthalmology is shown to be the first specialty. It existed as a specialty in Eygpt more than 3,000 years B. C., and also in Mesopotamia between 2,000 and 1,500 B. C.

The medical papyri are listed and their contents are reviewed. It is suggested that the Egyptians may have used a mold similar to penicillin in the treatment of disease.

Edna M. Reynolds.

Schoenberg, M. J. **A report on the progress of the glaucoma campaign during the past three years.** New York State Jour. Med., 1945, v. 45, April 1, p. 738. (See Section 8, Glaucoma and ocular tension.)

Scott, J. G. **Trachoma in West African Negroes.** Brit. Jour. Ophth., 1945, v. 29, May, pp. 244-252.

Trachoma in the West Coast African Negro is a mild disease, of the general infiltrative type. In Gambia, it affects 5 percent of the school children, 10 percent of the soldiers, and 25 percent of the population in some villages. In Nigeria and on the Gold Coast, 10 percent of the soldiers showed the presence of trachoma. Only 2 percent of the Cameroon soldiers were affected. Three hundred American Negro soldiers had no similar infection but were not immune. (References.)

Edna M. Reynolds.

Senà, J. A. **Industrial lesions of the eye under the Argentine law.** Arquivos Brasileiros de Oft., 1944, v. 7, Dec., pp. 213-232.

The subject is reviewed in considerable detail, with an abundance of statistical material. Reference is made to a large number of occupational disorders, and also to the relation between accidents and a number of systemic and local conditions including trachoma, tumors of the eye, syphilis, tuberculosis, exophthalmic goiter, and neuroses and psychoses.

W. H. Crisp.

Somerville-Large, L. B. **Dublin eye hospitals.** Irish Jour. Med. Science, 1944, 6th series, Sept., p. 485, and Oct., p. 534.

The author reviews the development of the eye hospitals in Dublin from a historical point of view. He points out that this reflects the general advance in clinical medicine. The first Dublin eye hospital was the National Eye Hospital founded in 1814, at which time there were two ophthalmic hospitals in London and three in the provinces. The other institutions dealt with are Ophthalmic Hospital, 1829-1834; Coombe Lying-In Hospital and Dublin Ophthalmic Dispensary, 1836-

1847; St. Mark's Ophthalmic Hospital for Diseases of the Eye and Ear, 1841-1904; Dublin Infirmary for Diseases of the Eye and Ear, 1872-1875; and the Royal Victoria Eye and Ear Hospital, formed by combination of the National Eye and Ear Infirmary, founded in 1815, and St. Mark's Ophthalmic Hospital, founded in 1844. Brief descriptions are given of the leading clinicians of the time and their relation to the various hospitals.

Owen C. Dickson.

Streltsov, V. **The function of the eye in aviation.** Amer. Rev. Soviet Med., 1944, v. 2, Dec., p. 126.

Acute visual disturbances, "black-out" or "red-out," have been encountered by pilots either while making high velocity turns or while taking a plane out of a dive. When the gravitational force is directed caudad, the retina becomes anemic and black-out results. When the gravitational force is directed cephalad, engorgement of the retinal and choroidal vessels occurs and red vision or red-out is caused.

The glare of searchlights obscures the vision of the dark-adapted eye of the pilot for a considerable length of time and he may miss important signal lights or lights from airplanes. Dark glasses worn in daytime for several days before nocturnal maneuvers increase the sensitivity of the eye to light.

Anoxia at a height of 4,000 to 5,000 meters causes diminution of visual acuity to one-fourth of normal. It can be improved by taking benzedrine in doses of 20 mg., or 200 to 300 mg. of ascorbic acid, or 100 mg. of a synthetic preparation known as 8-methyl caffeine prior to high altitude flying.

At 5,500 to 6,000 meters color perception becomes very difficult. Accommodation, which is intimately connected with judgment of distance, is markedly impaired by anoxia. Decrease in color and light perception is accompanied by loss of depth perception, furthermore the threshold of time required for judgment of depth is raised. The pilot, therefore, is compelled to circle over the airdrome several times before landing.

Most of these impaired functions occurring in high altitude flying are fully restored by intake of oxygen.

R. Grunfeld.

Vail, D. T. **Ophthalmic education.** Trans. Ophth. Soc. United Kingdom, 1943, v. 63, pp. 218-223.

The author reviews the history of ophthalmic education in the United States. The American Academy of Ophthalmology and Otolaryngology, the American Board of Ophthalmology, and the development of ophthalmic residencies have been the chief influences for the advancement of ophthalmic education. The Academy provides refresher courses and guides according to the requests of its members. For five days a year its members have the opportunity of instruction from experts in parts of the field. Twenty lectures may be going on at the same hour and the member must make his choice. The topics chosen range from a review of glaucoma to a continuous course in advanced slitlamp microscopy or pathology of the eye. Beside the instructional programs the usual scientific program of six to eight papers is presented to the entire membership. There are also scientific and commercial exhibits and a teachers' section. The Academy also provides a monthly home study course for hospital internes and residents and others who are unable to follow a basic study

course. It also provides funds for special research work.

The American Board of Ophthalmology was organized in 1916. Its purpose has been: (1) to elevate the standards of ophthalmology; (2) to determine the competence of practitioners professing to be specialists; (3) to arrange and conduct examinations to test the qualifications of candidates who appear before the Board for certificates of qualification as specialists in the field of ophthalmology, (4) to issue certificates to candidates successful in demonstrating their proficiency; (5) to act as advisers to prospective students of ophthalmology; (6) to serve the public, hospitals, and medical schools by preparing lists of specialists certificated by the Board. 2,142 ophthalmologists have received the certificate of the Board. Many societies require the certificate as a prerequisite for memberships and many hospitals require the certificate for appointment or promotion. Beulah Cushman.

Walkingshaw, R. **Ophthalmology in Lagos, 1943.** Brit. Jour. Ophth., 1945, v. 29, May, pp. 221-224.

A report of 3,205 cases seen in the Eye Clinic of the African Hospital in Lagos, Nigeria, is given. In 452 cases of conjunctivitis only a very few instances of Morax-Axenfeld or Koch-Weeks infection were found. Spring catarrh was found affecting the lids in only two cases. The remainder were of the limbal type. The number of trachoma cases was sufficient to warrant a special session of the clinic. The majority of the trachoma patients showed exacerbations of the acute stage. Many had pannus covering most of the cornea and extreme degrees of entropion were quite common. Pterygium is extremely common in Lagos.

Many types of keratitis were seen in the clinic but there was not a single case of syphilitic interstitial keratitis in spite of the high incidence of venereal infections reported among the general out-patients of the hospital. Most corneal ulcers were of the simple staphylococcal type. Limbal ulcer was fairly common, but there were only two cases of dendritic ulcer and both of these were in European patients.

Iritis was not common, and the author's impression was that posterior synechiae are not nearly so common as in European countries. Cyclitis was found to be the principal affection of the uveal tract. Fine deposits were frequently found on the posterior lens surface in routine ophthalmic examinations, and in some cases the exudate had formed a complete cyclitic membrane.

A striking proportion of unilateral cataracts were seen in patients aged 30 years and upward. They had the appearance of simple senile cataract, and seemed closely related to dietary deficiency. Very few were sufficiently advanced to warrant operation. Not a single case of diabetic or nephritic retinitis was found, and there was no case of optic neuritis or papilledema. Optic atrophy was extremely common, the great majority of the cases being due to avitaminosis. Only one case of acute congestive glaucoma in an African was discovered, but chronic glaucoma is a common complaint. Since there is little industry in the country, the foreign bodies were all of a comparatively simple nature. The incidence of strabismus is certainly much lower among the general population than in Europe. Only one case presented itself

at the clinic in over 3,000 patients. (3 tables, references.)

Edna M. Reynolds.

Weld, S. B. **Old Farms Convalescent Hospital for the blind soldier.** Connecticut State Med. Jour., 1944, v. 8, Dec., p. 875.

The hospital has a capacity of two hundred beds and has now an enrollment of about fifty men. It has on its staff a psychologist and three councilors with years of experience in placing men in jobs for which they show adaptability. The usual stay in hospital is four months but many remain longer. The soldier is taught to become familiar with machines, such as the drill, press, and lathe. He learns rug weaving, toy making, plaster modeling, gardening, poultry raising, printing, and book binding. Later he is placed in an industrial plant in a nearby city. He is taken there in the morning, works all day alongside a man with sight in both eyes, and is brought back in the evening. R. Grunfeld.

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ANATOMY, EMBRYOLOGY, AND COMPARATIVE OPHTHALMOLOGY

Drager, G. A., and Baker, C. A. **An anatomical investigation of the retino-pituitary reflex.** Texas Reports on Biol. and Med., 1944, v. 2, Winter, p. 401.

Three weeks after enucleating one eye from adult pigeons, microscopic examinations were made of the severed optic nerve and the various structures related to the optic system.

Since no degenerated fibers could be traced from the optic tract to the hypophysis, direct connection between the optic nerve and the pituitary gland, in the form of an unmyelinated optico-posterior pituitary nerve pathway, still remains a possibility.

Francis M. Crage.

Herrmann, H., and Moses, S. G. **The cytochrome oxidase activity of the lens of bovine eyes.** Jour. Biol. Chem., 1945, v. 158, March, p. 47.

The addition of cytochrome to preparations from the lens cortex greatly accelerates the oxidation of hydroquinone, suggesting the presence of cytochrome oxidase in the cortex.

R. Grunfeld.

Hess, W. N. **Visual organs of invertebrate animals.** Scientific monthly, 1943, v. 57, Dec., p. 489.

The author states that, while accommodation is generally attributed only to invertebrate animals, there is some evidence that in certain higher mollusks, such as the squid, contraction of the iris sphincter increases the pressure on the vitreous humor, and so causes the lens to be pushed forward, changing the focus of the eye.

Francis M. Crage.

Robbins, B. H. **Dinitrophenol cataract in the chick; effect of age.** Jour. Pharm. and Exper. Therapeutics, 1944, v. 82, Nov., p. 301.

Ingestion of food containing 0.25 percent dinitrophenol sodium, by 15 chicks varying in age from 65 to 300 days, led to development of lens opacities in 14 of them. In one chick, 300 days old, the lens remained clear.

Francis M. Crage.

Schneider, R. W., Lewis, L., Moses, J., and McCullagh, E. P. **Retinal hemorrhage and lens changes in alloxan**

diabetes in rabbits. Jour. Lab. and Clin. Med., 1945, v. 30, April, p. 364.

Retinal hemorrhages did not develop in rabbits made diabetic with one or two large injections of alloxan, as long as they maintained the normal level of plasma proteins. If, however, the animals showed a reduction in total protein and plasma albumin, retinal hemorrhage developed within one to three months. After experimental reduction in plasma albumin and subsequent administration of alloxan, retinal hemorrhage appeared in from five to seven days. It appeared in one animal in spite of insulin and polyvitamin therapy.

Peripheral lens vacuoles were observed in all animals. The lens changes progressed in direct proportion to the duration of the diabetes.

R. Grunfeld.

NEWS ITEMS

Edited by Dr. Donald J. Lyle
904 Carew Tower, Cincinnati 2

News items should reach the editor by the twelfth of the month.

Deaths

Dr. Nathan L. Bourne, Decatur, Illinois, died May 17, 1945, aged 71 years.

Dr. Joseph W. Chetwynd, East Liverpool, Ohio, died May 2, 1945, aged 63 years.

Dr. Alfred E. Ewing, McDonald, Ohio, died May 23, 1945, aged 75 years.

Dr. Thurman B. Haas, McArthur, Ohio, died March 15, 1945, aged 58 years.

Dr. G. L. Hoffman, Sr., Norristown, Pennsylvania, died May 17, 1945, aged 77 years.

Dr. George L. Lewis, San Angelo, Texas, died April 5, 1945, aged 63 years.

Dr. George F. Seiberling, Allentown, Pennsylvania, died May 6, 1945, aged 75 years.

Dr. John W. Swindell, Greenville, Texas, died April 20, 1945, aged 75 years.

Dr. Marcus Thrane, Hood River, Oregon, died April 10, 1945, aged 70 years.

Miscellaneous

The American Board of Ophthalmology wishes to make the following announcement: Due to transportation difficulties, the examination of the Board, originally scheduled for Chicago, October, 1945, has been postponed to January 18th through 22d inclusive, 1946. 1946 examinations: Chicago—January 18th through 22d; Los Angeles—January 28th through February 1st; New York—May or June; Chicago—October.

Washington University is offering an eight-months' postgraduate basic course in Ophthalmology, beginning October 1, 1945, to qualified physicians; fee $600. Anyone interested should address the Registrar, Washington University School of Medicine, Saint Louis 10, Missouri, or Dr. Lawrence T. Post, 640 South Kingshighway, Saint Louis 10, Missouri.

Societies

At the annual meeting of the Buffalo Ophthalmologic Club the following officers were elected for the 1945-1946 season: Dr. William H. Howard, president; Dr. Dante J. Morgana, vice-president; and Dr. Sheldon B. Freeman, secretary-treasurer. Meetings are held on the second Thursday of each month from October to May.

Personals

Dr. Edward J. Curran, Kansas City, retired as professor of ophthalmology and head of the department at the University of Kansas School of Medicine, Kansas City, Kansas. He has been succeeded by Dr. John A. Billingsley, Kansas City, Kansas.

The Leslie Dana Gold Medal will be presented this year to Dr. William Zentmayer, professor emeritus of diseases of the eye, Graduate School of Medicine, University of Pennsylvania. Dr. Zentmayer was selected for this honor by the St. Louis Society for the Blind, upon the recommendation of the Association for Research in Ophthalmology. Dr. Zentmayer is a member of numerous medical, public health, and other scientific organizations. The conditions of the Leslie Dana Gold Medal award set forth that it is to be made for "long meritorious service in the conservation of vision in the prevention and cure of diseases dangerous to eyesight; research and instruction in ophthalmology and allied subjects; social service for the control of eye diseases; and special discoveries in the domain of general science or medicine of exceptional importance in conservation of vision."

Col. Derrick T. Vail (MC) has been released from the Army but is retained as Civilian Consultant in Ophthalmology to the Surgeon General. He is replaced by Major Trygve Gundersen as Chief, Ophthalmology Branch, Surgical Consultants Division Office Surgeon General. Lt. Col. James N. Greear has returned from the European Theatre of Operations and is in the process of being released from the Army.